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CENTRAL INTELLIGENCE AGENCY
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COUNTRY China

SUBJECT The Public Utilities of Shanghai

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THE PUBLIC UTILITIES OF SHANGHAI

1947 — 1948

T. C. Tsao

Approved For Release 2002/07/29 : CIA-RDP80-00926A005700100001-9

THE PUBLIC UTILITIES OF SHANGHAI

1947 — 1948

T. C. Tsao

With the Compliments of

*T. C. Tsao
& Mr. King Shinn*

1st Issue. Sept. 1945-Aug. 1946.

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A RÉSUMÉ OF THE YEAR'S WORK

1. THE TARIFF FORMULAE

Since January, 1948, a system of "automatic" formulae for calculating the tariffs of various utility services has been promulgated by the Executive Yuan. The formulae were founded on the basis of the data and statistics concerning the operation of the utility companies, made available through the Bureau of Public Utilities. The utility tariffs were fixed monthly on the basis of these formulae by substituting the cost of living index, coal price and oil price, foreign exchange rate, and in some cases metal index, prevailing at the end of the previous month.

The system worked smoothly up to the end of May, 1948, before which general commodity prices had risen in a relatively slow though steady pace. Since June, however, the Central Government changed its foreign exchange policy by adopting the system whereby the foreign exchange surrender certificate rate, which was subject to market fluctuations, must be paid on top of the official exchange rate. This change caused frequent jumps of foreign exchange rates, which in a matter of 80 days from the beginning of June to August 19, had jumped to 15 times up, with the inevitable consequence of big increases of commodity prices. The utility tariffs to be adjusted only monthly could not follow pace with the price increases, thus causing financial losses to the utility companies and creating a crisis which was solved only after Government subsidies and/or loans were granted. In fixing the tariffs for the month of August, therefore, an attempt was made to add fifty percent to the foreign exchange rate, cost of living index and metal index established at the end of the previous month. The attempt was believed to be fair under the circumstances but when enacted met strong opposition from the City Council. Finally, the 50 percent was taken off and in its place the Municipal Government granted subsidies of equivalent amounts to the utility companies. Since August 19, The Central Government promulgated a currency reform by adopting "Gold Yuan" and a new financial policy by freezing all commodity prices, including utility rates. During the months of September and October, governmental subsidies were given to the various utility companies to enable them to maintain their operation. On November 1, the Central Government issued an unfreezing order. Subsequently the utility tariffs have been adjusted as realistically as possible, according to the actual costs of operation of the services.

2. THE UNITED POWER COMPANY PROJECT

The project has been placed among the top priority lists in ECA's China Aid Reconstruction Program. The loan for covering the part of capital in U.S. dollars for the project has not yet been granted. However, a topping unit turbo-generator set has been granted by ECA to the Shanghai Power Company, which is a wise choice, but is not an alternative to the UPC Project.

For the best interests of overall power development in Shanghai, the United Power Company Project must be promoted. The writer understands that the Project still remains as Priority A among ECA's programs and it may receive very favorable consideration when ECA's program continues for the second year.

3. PUBLIC TRANSIT COMPANY IN FORMATION

The City Bus Service has operated bus transportation facilities for the public for over two years already, with the objective of organizing a modern city transit company. The principles of the incorporation of the company have been approved and passed by the Municipal Government and the City Council. The City Council later, however, decided to have 60 percent of the total capital to be invested by private individuals and 40 percent to be taken care of by the Municipal Government. An appraising committee was later formed, consisting of four representatives from the Municipal Government and the City Council and one representative from the Chartered Accountants Association, in addition to 4 experts. The fair value of the assets of the City Bus Service was made out on October 28 to be about GY\$9,530,000. The appraisal, however, is automatically invalid after the devaluation of gold yuan in relation to foreign exchange announced by the Central Government on November 1, 1948. Up to the time of writing this report, the time of formation of the City Transit Company is still under serious consideration of the City Council and the Municipal Government.

4. THE YANGTZSEPOO TRUCK FERRY PROJECT

As to water transportation, particularly, the trans-Whangpoo truck ferry service, this year has seen the upward development of the vehicular ferry service at Nan-ma-tao (South Wharf) inaugurated on Double Tenth Day, 1947. The facility was gradually appreciated by the public, as can be viewed from the rise of the number of trucks and automobiles passing the ferry from a dozen a day at the beginning of the service to 2 hundred motor vehicles a day recently.

To meet the rising need of the community and to assist in the plan of alleviating traffic congestion at the Bund, a new project at Yangtzepoo has been drafted and will be carried out as soon as the necessary funds can be financed. The complete project consists of 2 parts—1st, a simple truck ferry, and 2nd, a more elaborate

construction with combined truck and passenger accommodations. The estimated construction capital is about US\$1,000,000.

5. CONTINUATION OF WATER SUPPLY EMERGENCY PROGRAM

Water supply is both a public utility and public health service. The Bureau of Public Utilities started in March, 1948, the service of the newly-built 600,000 gallon reservoir on Chung Cheng Road (Western). A Scrutinizing and Allocation Committee for subscriptions of water supply in the Western area has been organized. The Committee was represented by the Shanghai Waterworks Company, the City Council and the Bureau of Public Utilities. It is gratifying to report that about two hundred subscribers have already been given water.

The Bureau has further this year successfully completed the connection of water mains of the Inland Waterworks Company with those in the Western District, through pipe lines owned by the French Company and the Shanghai Waterworks Company, thus diverting a portion of surplus water from the Inland Waterworks Company to the Western District. The connection line has a total length of 9 kilometers. To compensate for the loss of water head, a boosting pump station is being installed on Siatu Road. The whole scheme is proceeding smoothly with cooperation from the waterworks companies concerned and is scheduled to be completed by the end of this year. The successful completion of the scheme will enhance the water supply in the Western area by 3,000,000 gallons daily, sufficient to provide water for 120,000 people.

6. HIGH PRESSURE GAS MAIN INTERCONNECTION

Further to the Bulk Supply Agreement made between the Shanghai Gas Company and the Woosung Gasworks last year, the two concerns have again manifested their spirit of mutual co-operation by agreeing to and starting the construction of a high pressure gas main from the Uryang Road governor house of the Woosung Gasworks to connect with the Tangku Road high pressure main of the Shanghai Gas Company so that gas made by the Woosung Gasworks during the night can be transmitted to the Sitzang Road reservoir of the Shanghai Gas Company for redistribution during the day. This is completely in line with the Bureau's policy and is to be highly commended.

7. THE FRANCHISE OF THE FRENCH-OWNED ELECTRIC LIGHTING & TRAMWAY COMPANY

The Compagnie Francaise de Tramways et d'Eclairage Electriques de Shanghai operates, besides electric power and tramway services, a few bus lines and a waterworks, as authorized by the franchise and agreement signed between the Company and the

ex-Council of the French Settlement. The Franchise will terminate on May 1, 1950. The Municipal Government, following the national policy of encouraging foreign investment, has taken steps for the negotiation of the extension of the franchise, separately, for electric power, water supply and public transportation, with certain important provisions. The negotiation was interrupted due to the sudden death of Mr. A. Sigmann, the General Manager of the Company. It is hoped that it may be resumed soon.

8. THE TRAFFIC PROBLEM

Traffic congestion still remains a knotty problem in Shanghai. One of the many causes lies in the great varieties of vehicles running in the streets, each with its own speed. The immediate solution lies in increasing mass-transportation facilities, eliminating pedicabs and other man-propelled vehicles, and removing the many bottlenecks in busy thoroughfares.

As a first measure to ease traffic congestion, based on suggestions of Dr. Thomas Conway, Jr., a set of automatic synchronized traffic lights was installed in Nanking Road (Western), starting from Shensi Road to St. Georges. In that section, a east- or west-bound motor car can pass through 5 blocks with green lights at a speed of 25 miles per hour.

9. TELEPHONE EXTENSION PROGRAM IN PROGRESS

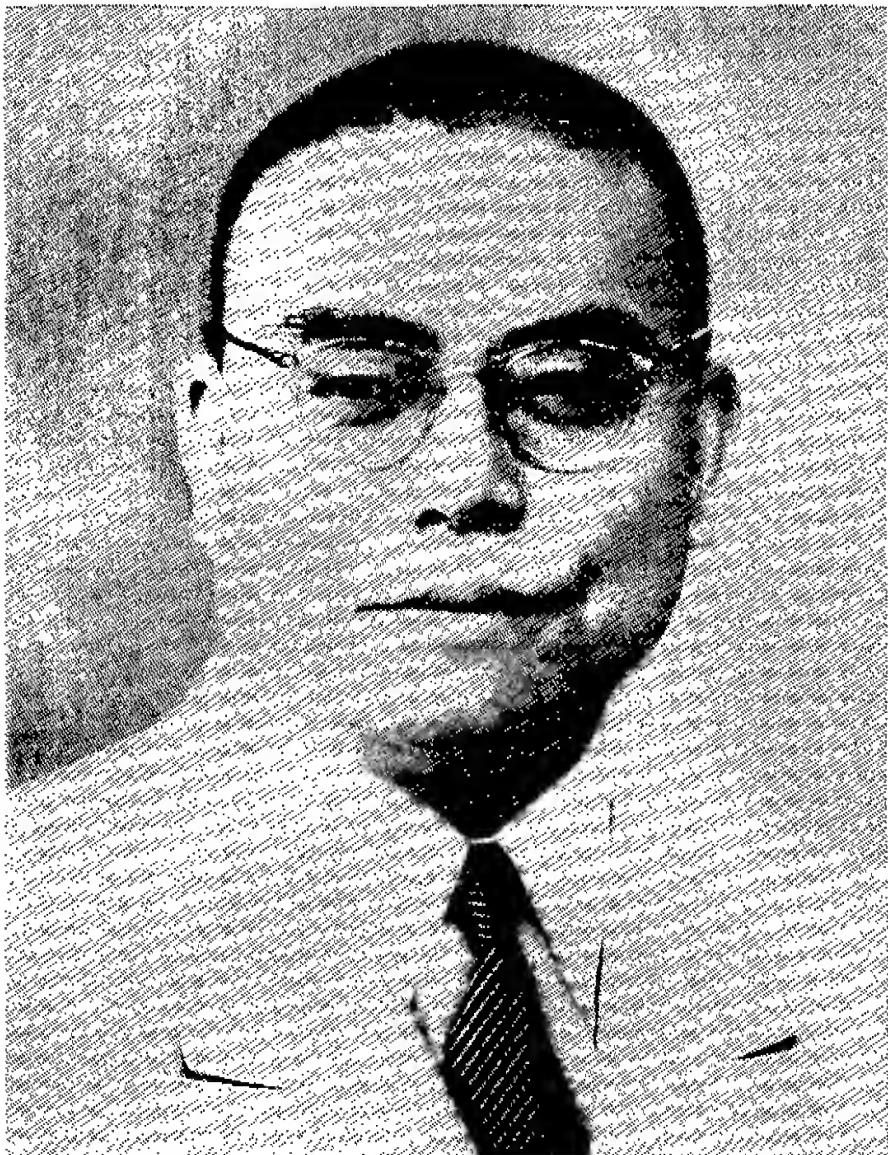
The Shanghai Telephone Company is steadily progressing with the program of installing 10,000 line extension of telephone service. These lines have been allocated to different offices. As scheduled, the 1,400 lines for Fokien Office (1st digit "9") and the 1,000 lines for Montigny Office (1st digit "8") are to be completed for cut-over on December 31, 1948, while the remaining 7,600 lines allocated to West and North Offices will be completed within next year.

10. A SUMMING UP

The present year has witnessed an unprecedentedly difficult and trying period for the utilities of Shanghai. Scarcely a day passed without the appearance of some problems demanding immediate attention. It is only through the able guidance of Mayor K. C. Wu, the timely assistance of the Governors of the Central Bank, and the ardent cooperation of all my co-workers that these day-by-day problems were realistically solved. Little though has been accomplished, the effort is by no means small. I wish to take the opportunity to extend my heart-felt appreciation and thanks to all concerned and to solicit and pledge them for more support.

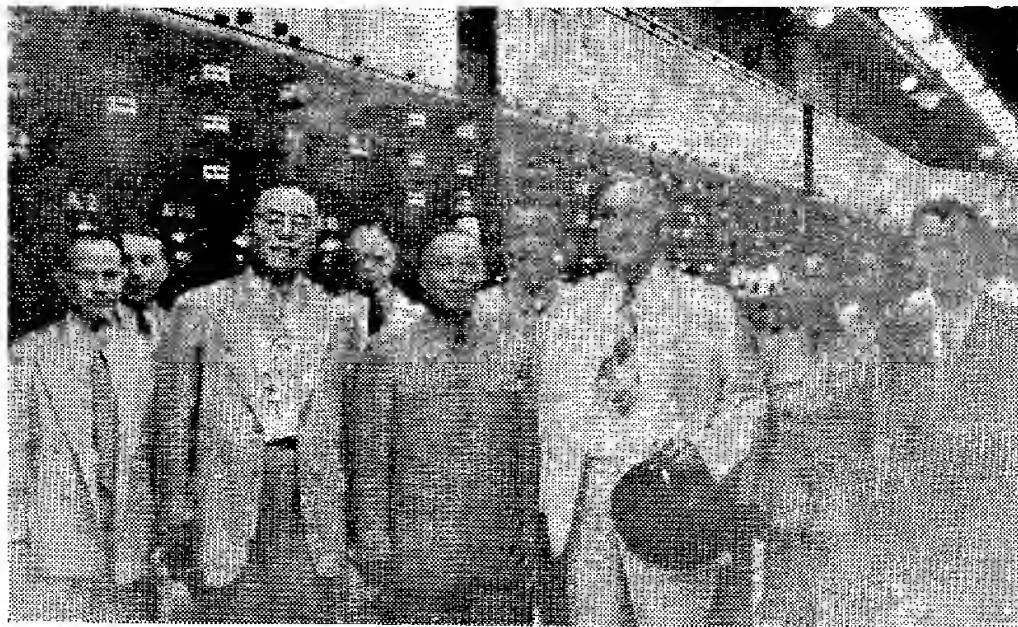
T. C. TSAO.

December 2, 1948.



MR. T. C. TSAO
Commissioner of Public Utilities of Shanghai

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Vice President Li Tsung Jen (middle) visiting Shanghai Power Company with Commissioner T. C. Tsao (left), Mr. P. S. Hopkins (right), President of S.P.C., Mr. C. J. Furguson (between Messrs. Li & Tsao) and Mr. K. Y. Wang (extreme left) of S.P.C., and Mr. K. D. Lee (extreme right), advisor to the P.U.B.

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PART I GENERAL REPORTS

1. SOME ESSENTIALS OF PUB'S POLICY

T. C. Tsao

Report made before the monthly meeting of SMG

The ultimate objective of the public utility services is to make them (1) Available to all, (2) Economical to all, and (3) Satisfactory to all.

In order to further the above objective, we need a definite and clear-cut policy in administering the public utilities.

In the establishment of a policy there are two considerations, theory and practice. Only a well-balanced coordination of the two will make the policy sound and workable.

Theoretically speaking our policy should fall along the following three lines:—

(1) Coordinated scheme of development under overall planning to be correlated with the development of the Municipality.

(2) Modern system of management resulting in higher efficiency and greater economy.

(3) Uniform standards of service and ultimate uniform tariff rates throughout the Municipality.

Against the three theoretical principles are three practical considerations which must not be neglected:

(1) The existence of different franchise areas which have been served by different utility companies, a result of the former political status of Shanghai.

(2) The obligation of the Municipality to honor the franchises of the companies granted by the former municipal councils.

(3) The absence of any overall plan as the companies designed plants to meet needs of their individual franchise areas.

After carefully weighing each factor, our policy in administering the public utilities of Shanghai has been formed, of which the essence is given below:

A. PROMOTION OF UNITED COMPANIES

State ownership of the utilities is on paper an easy solution to the problem. But our Government at present is financially unable to make the purchases of the utility companies and legally bound by the obligation carried over from the former municipal authorities to respect the franchises granted by

them to the companies. The united companies advocated by the Bureau of Public Utilities aim at united service to all areas of Shanghai without interfering with the rights of the existing companies. The United Power Company now under promotion is a good example. Pending the maturity of the formation of the united companies, the Bureau has established the City Bus Service, Woosung Gasworks, Pootung Waterworks, and the Western District Water Supply Planning Office, all of which are expedient measures in line with the future development of the various united companies.

B. ELIMINATION OF DISTRICT BOUNDARIES

The complete elimination of the district boundaries set up by the existence of different franchise areas will depend on the successful consummation of the united company projects. The Bureau of Public Utilities has, however, successfully brought about the partial elimination of such boundaries. The ethical conduct of the Shanghai Power Company has made possible the large amount of bulk supply power going to Nantao, Chapei, and Pootung. With the cooperation of the French Company, a number of bus routes which cross many of the "boundaries" are jointly operated by the City Bus Service and the French Company. Many of the city's green buses are operating through three past political areas, namely, the Municipal Area, the ex-International Settlement, and the ex-French Concession. The Woosung Gasworks entered into a bulk supply agreement with the Shanghai Gas Company. The Shanghai Waterworks Company, the French Company and the Western District Water Supply Planning Office have united their efforts in solving the water supply problem of the Western District. All these instances serve to illustrate the efforts of the PUB in eliminating the "boundaries" for the benefit of the populace of Shanghai.

C. INCREASE OF SUPPLY

Because of the limit set by the franchise areas, the utility services of Shanghai are in a very much unbalanced state, with a number of areas inadequately or even not supplied by the services. Regarding water supply, the Bureau is trying to expand the Pootung Waterworks, rebuild the Western District Water Station, and resume the supply of water to ships anchoring in the harbor. Emergency projects to alleviate the water shortage in the Western District are being carried out. The completion of the first stage of the project has boosted water supply in the District by 200,000 gallons daily. Granted enough funds, the 2nd stage of the project when concluded will increase the daily water output by 3,000,000 gallons. To supply water to the poor and

water for anti-epidemic uses, there are over 130 free water stations and retailing stations. Regarding gas, the Woosung Gasworks is supplying consumers in Northern Shanghai, while the Nantao gas mains now under planning will serve, partially, the population in the Nantao District. Regarding transit facilities, more lines are being added to the city bus service, while buses in urban districts are temporarily operated by private companies.

D. BALANCED DEVELOPMENT OF THE CITY

There is at present an extremely unbalanced state of development of the two banks of the Whangpoo River which is highly detrimental to the city's economic interests. The location of most of the city's wharves and godowns in Pootung makes the delivery costs of goods extremely high. The Bureau of Public Utilities initiated last year a vehicular ferry service in Nantao and is planning to build another one in Yangtzeppo. The PUB has instructed the Pootung Waterworks and the Pootung Power Company to devote all efforts to expand their services. When water, power, and transportation problems of Pootung can be solved, the day of its prosperity is anticipated.

E. IMPROVING INDUSTRIAL POWER SUPPLY

Shanghai is the industrial center of China. Power is the prime mover of industry. Since the developments of the utilities should match with the development of the city, industrial power supply must be adequately maintained to foster the industries. Although power supply for Shanghai has always been short, the PUB has tried its best to maintain the power needed by the industries. Industrial power consumption is over 60% of the total power generated. The restrictive measures of using electricity and the restrictions in the power consumption for household space heating or air conditioning are also for the purpose of giving more power to industries. These are, however, only expedient solutions. The final solution rests in the early establishment of the United Power Company.

F. UTILITY TARIFFS

The utility tariffs have direct bearing on the livelihood of the local populace. Since tariffs are fixed by the competent authority, the managements of the utility companies are under the supervision of the authority, and the profits of the companies are limited by law, therefore the utility tariffs, under normal circumstances, will not be so high as to affect the living of people, neither will they be so low as to affect the operation of the companies. The utilities are industrial enterprises. The object of industrial enterprise is reproduction. The essential element

of "reproduction" is profit. The Bureau of Public Utilities, in fixing the utility tariffs, consider the burden of the public on the one hand, and give the companies legitimate profits as provided by their franchises on the other hand. Recently, however, prices of commodities increase much more speedily and in greater percentages while the incomes of the mass of the population do not increase proportionally. The PUB with understanding on the part of the companies, can then only temporarily give the companies tariffs which will merely enable them to maintain their operation.

Meanwhile, the PUB has instructed the companies to minimize their expenditures, helped them to purchase fuel and foreign exchange in advance, and adopted the reverse block system so that the big consumers pay more while smaller consumers pay less. Since July, 1948 the Central Government changed its foreign exchange policy, adopting the exchange surrender certificate system. The dollar exchange rate jumped from CN\$480,000 to CN\$5,030,000, an increase of 9 times. Fuel oil and parts required by the utility companies are all imported and require exchange, and the depreciation and profit of the foreign operated utility companies are also calculated in foreign exchange. The COL Index was published twice a month since July. The companies were extremely short of revolving funds. The utility tariffs calculated at the beginning of the month and based on the average indices of the previous month under the circumstance do not yield sufficient revenues to enable the companies to meet their expenditures. All the companies consequently suffered deficits. To compensate for this loans from the Central Bank were arranged to provide revolving funds for the companies, and fifty percent had been added to COL Index, metal price index, and foreign exchange rate used in the formulae for calculating August tariffs. The new rates were designed to be realistic. The reverse block systems were still maintained. The companies were allowed to collect their bills from the big consumers twice a month.

G. PRESENT CONDITIONS

Three years have passed since V-J Day. Under the able leadership of Mayor K. C. Wu, hearty efforts of the companies, unreserved cooperation of the public, some improvements have been made for the utility services of Shanghai inspite of many difficulties. Comparing the statistics of the services in October 1946 with those of April, 1948, water, power, transit, gas and telephone services have substantially increased. Because power and transit services suffered most during enemy occupation they received our most attention and made the biggest increases. The following figures may be useful for reference:

Daily water production of Shanghai is now 100,000,000 gallons, monthly power generation 100,000,000 kwh 60% of which used by industrial consumers, daily gas production 4,000,000 cubic feet, there are 90,000 telephones with daily average number of calls 750,000, 40 public transit routes with 700 vehicles carrying 1,000,000 passengers daily, 16 ferry boats with 2 vehicular ferries, 18,500 streets lights 10,000 of which added since V-J Day, 150 sets of traffic lights with automatic lights installed in Nan-king Road (West).

From October, 1945 to April, 1948, the development of utility services of Shanghai can be seen from the following increases: Regarding water, production has increased 69%, length of pipes has increased 2%, number of consumers 22%. Regarding electricity, generating capacity has increased 327%, length of transmission lines 7%, and number of consumers 18%. Regarding gas, productive capacity has increased 103%, length of pipes 9%, and number of consumers 98%. Regarding telephone, number of sets has increased 7%, and number of subscribers 8%. Regarding tramways, number of routes has increased 45%, length of routes 89%, number of trams 15%. Regarding electric trolley bus, number of routes has increased 29%, length of routes 18%, number of trolley bus 65%. Regarding buses, number of routes has increased 1,700%, length of routes 1,370%, and number of buses 1,330%. Regarding ferry, number of ferry boats has increased 220%, total tonnage 159% and number of lines 200%. Regarding street lights, number of street lamps has increased 119%.

(Published in "Central Daily News", August 2, 1948)

2. THE ADMINISTRATION OF PUBLIC UTILITIES OF SHANGHAI

Dr. T. C. Tsao, Commissioner of the Bureau of Public Utilities of Shanghai, gave a lecture last night on the "Administration of Shanghai's Utilities" in the Chinese YMCA Auditorium.

This speech was the second of a series sponsored by the Municipal League of China for augmenting public knowledge on city affairs.

Dr. Tsao started his well-planned and interesting speech by stressing the importance of adequate and efficient utility services for the welfare of the public.

He then went on to elaborate on the accepted abbreviation of his Bureau, the PUB. "P" stands for Popularization, Dr. Tsao said, we want to make the utility services popular so that every citizen will be able to afford to use them. "U" stands for Unification, whereby we hope to unify and coordinate all the utility services for the best interest of the public. "B" stands for Beautification. The word does not mean beautiful in its usual sense. It rather means the amenity of the city due to good services such as bright street lamps, adequate and comfortable public transport, punctual ferry service, orderly wharf traffic, clean gas supply; those are the things which we call beautiful and which we must strive for.

Official Supervision

The main function of the Bureau of Public Utilities is the supervision over the various utility companies instead of direct management of the above. With the fundamental aim of serving the best interest of the public, the Bureau helps, instead of interferes with, the companies, and gives counsels or advices rather than orders. The fundamental policies of the PUB in administering the utility services are expansion of services, enhancing of efficiency, and rationalization of tariffs.

The present operation of the utilities of Shanghai is severely handicapped by the universal postwar shortage of essential materials and capital so that after the destruction or removal of plants by the enemy we have a herculean task in rehabilitating them. Our efforts have so far resulted in the following achievements:

1. The daily water output now reaches one hundred million gallons, which divided by the population of 5,000,000 nets twenty gallons per day for each person.

2. Monthly power production is now roughly one hundred and seven million kilowatt hours, sixty percent of which is used by industrial consumers.

3. Daily productive capacity of gas supply is now five million cubic feet which hardly meets the demand of the public. There is practically no new installation for gas connection.

4. There are at present 94,920 sets of telephone, or one telephone for every fifty persons in Shanghai.

5. Local transit facilities now number 550 cars, including trams, buses, and trolleys. The quantity is still insufficient for the huge population of Shanghai. It is estimated that 3 times the number of public transport vehicles are needed to meet the situation.

UPC and Foreign Capital

A word may be mentioned about the efforts of the Bureau in promoting the United Power Company Project, the successful consummation of which will no doubt give stimulus to other unification schemes. The UPC Scheme is the most sound project, as recognized by all, and the Central Government has agreed to it in principle. It only remains to pass through the necessary legislation steps.

Our attitude to the foreign-operated utility companies are based on two principles: viz (1) in respecting their franchises and in giving them legitimate profit. For quick economic rehabilitation and reconstruction, it is our national policy to welcome foreign capital; (2) in also treating some of them, which are efficient and up-to-date in operation system, as educational institutions for training technical personnel for China's future constructional work.

(China Daily Tribune, April 13, 1948)

3. UTILITIES OF SHANGHAI

Commissioner T. C. Tsao of the Public Utilities Bureau, in the course of an interview with a representative of this paper yesterday, gave a comprehensive clarification of the principles guiding the Bureau in the administration of the utility services in Shanghai.

In addition Mr. Tsao also referred to plans of the Public Utilities Bureau to enhance the prosperity of this city.

The principles guiding the Bureau in its works to improve and rationalize utility services, he said, are to establish systems and to carry out expedient solutions, as well as long range plans.

Touching on the Bureau's policies for the administration of the utility services, Commissioner Tsao has this to say: "Shanghai's utility services are in size and scale the largest in China and the number of units operating them is unsurpassed by other leading cities. Over-population, extensive development of industries and commerce, plus the difficulties in restoring war-damaged plants have, however, made the present services still inadequate to meet the demand. The many units operating the utilities, which were each established to serve their own franchise areas without consideration of the City as a whole, have resulted in the irregularity of service standards and non-uniformity of tariffs. The whole systems were far from rational. The guiding principles of PUB's work for the improvement and rationalization of the utility services are the establishment of systems and carrying out of expedient solutions as well as long range plans.

"The construction, maintenance, and management of utility services should be done under established systems so that they can be coordinated with the development of the City and the need of the public. Upon rationalization of systems, our efforts must be directed to carry out expedient solutions and also long range plans. For example, through the efforts of SPC, coal for generating one kilowatt hour of power has been reduced from 2.16 pounds to 1.9 pounds. The total generating capacity has in the last year increased from 154,300 kilowatts to 193,840 kilowatts. The servicing of municipal buses, the restoration of Nantao wharves, the carrying out of the emergency water supply plan for the Western District and the promotion of the United Power Company and United Transit Company projects all serve to manifest that our efforts have been made for expedient as well as fundamental solutions.

"After the establishment of rationalized systems, personnel capable of running them are indispensable. The PUB, together with the well-equipped and large-scale utility companies in Shanghai, has sponsored training classes, offering technical training of 2 to 3 years to engineering graduates of China's leading universities. These personnel will be invaluable assets and can be used in the future development of utility services.

Attitude Toward Foreign Companies

Asked about the attitude of the PUB toward foreign companies, he said: "The question can be answered from two different angles, legal and factual.

"(1) Legal point of view—The foreign companies were organized during Settlement and Concession days and had been awarded franchises by the former Councils. With the rendition of the Settlement and Concession, the Municipal Government of Shanghai has become the legal successor to all the rights and obligations of the ex-Councils and has, according to the new Sino-American and Sino-British treaties, the obligation of acknowledging such franchises. "(2) Factual point of view—To welcome foreign investment for post-war reconstruction of China has been a national policy since it was passed by the National Defence Supreme Commission in November, 1944. The Central Government has revised the Company Law to make it compatible with the above resolution. If future foreign investment and companies are welcome, it follows naturally that the existing companies must be encouraged to stay. Besides, the existing companies have been willing to abide with our laws and instructions and have cooperated with us in every possible way. They are in this respect no different from the Chinese companies."

The "Automatic Formulae"

Speaking on the adoption of the "automatic formulae" for revision of utility tariffs, Mr. Tsao explained, "We cannot allow the companies to terminate operation of any utility service. Hence we have to approve realistic revisions of utility tariffs to make them compatible with the ever-rising prices of general commodities. On the other hand, we must not impose any unfair burden on the public. The best solution lies in working out a scientific, equitable basis by which the minimum costs of operation of the utility companies can be calculated, on which will be based the tariffs. The "automatic formulae," containing constants and variables, are exactly for this purpose. The constants, such as quantity of coal for generating one unit of power, are arrived at by careful scrutinization and close investigation to past statistics of the companies. The variables are reduced to such bare essentials as COL

index, foreign exchange rates, price of coal, metal price index, etc., which constitute the utility costs. Thus operating costs for each month can be computed from the quotations of the various variables.

"The fixing of the constants for the formulae was done after much care and deliberation. The figures have been kept at minimum. Our objects are twofold: to reduce the burden of the public and to encourage the companies to spare no efforts to enhance efficiency so that the approved rates, in addition to covering operational costs, can provide a margin for legitimate profit as authorized by the franchises. The utility companies of comparatively low efficiency may find it necessary to improve to their own advantage."

Training of Technical Staff

Questioned about progress in the training of the technical personnel, Mr. Tsao said that starting from 1946, the PUB, in cooperation with the Shanghai Power Company and the Shanghai Telephone Company, had organized training classes. There are now 58 persons under training. It is the aim of the training program to train technical men not only to serve the utility companies concerned but also to help develop the utility industries of China, he said.

Plans For Shanghai's Prosperity

Asked about the Bureau's plans to make Shanghai a prosperous city, Mr. Tsao said:—"Increasing production and facilitating transportation are the two chief requirements of the future prosperity of Shanghai. To increase production the question of power supply must be solved. Before the establishment of the United Power Company, the PUB urged the different power companies to exert all efforts to increase their generating capacities so that, later on during the peak load hours power supply to factories can still be maintained. The PUB, in addition to appealing to the public to save the use of electricity themselves, has requested the Central Government to start daylight saving time from April 1 so that more electricity can be saved for industrial purposes.

"To reduce the productional costs of industries, the PUB has always attempted to make power for industrial consumers as cheap as possible. Industrial power rate now is about 20 percent less than the rate for lighting. We hope to make further reduction in the future.

"To coordinate international and national transport system, a Shanghai Port Authority should be established as quickly as

possible. Good railway connections must be made to the harbor and air transportation linked with waterways and railways. A city transport plan has been mapped out according to the location of land, water and air terminals, systematically correlated. A United Transit Company is to be promoted to establish a satisfactory transportation system in the City."

According to preliminary estimates, Shanghai at present will need 1,500 buses, Mr. Tsao said, but the buses now in operation number 500 or only one-third of the estimated requirement. The number needs substantial increases.

The formation of the transit company has been approved by the Fifth Session of the City Council and it is hoped to realize this before the end of this year, Mr. Tsao said in conclusion.

(North China Daily News, March 16, 1948)

4. THE FUTURE PROSPERITY OF SHANGHAI

"Improved harbor facilities, adequate electric power supply, and coordinated transportation system are the three things the implementation of which will contribute most to the future prosperity of Shanghai," stated PUB Commissioner T. C. Tsao in a broadcast speech in the Police Radio Station recently. The following is the text of Commissioner Tsao's speech:—

What are the things the implementation of which will contribute most to the future prosperity of Shanghai?

I may perhaps serve best to start our discussions with a brief analysis of the characteristics of Shanghai. First of all, Shanghai is essentially an international port and the main foundation of its economic structure lies in the ease with which trade and commerce can flow in and out through its harbor and transportation facilities. Secondly, a review of past and present statistics will reveal that the light industries in China have mostly concentrated in Shanghai. Shanghai was, is, and will be the center of light industries in China.

Having brought out the outstanding characteristics of Shanghai, we may have a direct approach to our subject proper, "The Future Prosperity of Shanghai." Our answer is almost automatic: —(1) Improved harbor facilities, (2) adequate electric power supply, and (3) coordinated transportation system. These, in our opinion, constitute the elements which are most conducive to the future prosperity of Shanghai.

Shanghai's Harbor

We shall begin by giving a brief evaluation of the harbor of Shanghai. In prewar days, imports and exports handled by the port of Shanghai amounted to over 30 percent of those of the whole nation. With the ending of the war, the figure leaped to 85 percent. In 1935, the quantity of import and export was more than thirty-five million tons. Needless to say, when conditions resume normal, what with capital goods to import and finished goods to export, the quantity may progressively increase. Our harbor as it is at present will naturally require much improvement both in its equipments and management.

The requirements of a good harbor are manifold. We must have sufficient and adequate berthing places for vessels and reasonably high speed in loading and unloading, i.e., the rapid transfer of cargo from water carriers to land carriers, and vice versa, we

would require modern, up-to-date port facilities, such as mechanized cranes, classified godowns and wharves. We would also require a sound and centralized port authority. I am happy to say that the Shanghai Port Regulation Commission had completed a draft for the Proposed Permanent Port Authority of Shanghai and submitted it to the Executive Yuan for approval.

The construction of wharves has much bearing on the smooth operation of the port and in there the opinions of the experts are divided. One group advocated the dug-in dock system as adopted by London, the other group gave decided preference to the full utilization of the two banks of the Whangpoo River with either floating pontoons or fixed wharves, as existing at present. Both systems have their own advantages and disadvantages. In our future planning, we shall hope to use a conglomoration of the two, with a little emphasis on the latter because of its lesser initial costs. The former, however, must be resorted to, when justified, because it is specially convenient to railway connections.

Our main job at present is, after the approval of the Proposed Organic Law of the Port Authority by the Central Authority, the establishment of the Port Authority and the assessment of capital. Our efforts hereafter will be devoted along these lines.

Electric Power

A look into the consumption records of electric power in electric power in Shanghai will disclose that Shanghai has been well developed in its industries, especially light industries. At present the monthly total of power consumed is roughly one billion kilowatt hours, of which 60 percent is used by industrial consumers. Among the industrial usage, by far the largest is cotton mills, which occupy more than 60 percent of the total. Following their heels are flour mills, weaving mills, oil extracting business, cold storage business, etc.

Despite the efforts of the competent authorities and concerns the rehabilitation of industries of Shanghai has been much handicapped by an acute power shortage. Many spindles of cotton mills are not being operated. Cotton mills have to shut down their plants rotationally twice a week. Load to mills has to be staggered in case of breakdown of one generator. Such happenings always cost the manufacturers irrevocable economical losses. An immediate remedy is indispensable to the future prosperity of Shanghai.

Shanghai has surplus capital, competent technical personnel and laborers, and a good environment for industrial development. The best solution to any unemployment problem is to

direct surplus capital to invest in industries, thereby offering productive employment to the jobless and indirectly stabilizing the market and curbing the ever rising inflation. It is estimated that at present there is a shortage of 60,000 kilowatts of power, which can be immediately absorbed by the now idle equipment and labor. It will provide 90,000 persons with work and its productive value per month will be equivalent to seventeen million U.S. dollars. It is for this purpose that the Shanghai Municipal Government started active promotion of the United Power Company Project which plans for an initial installation of 100,000 kilowatts of generating capacity to cater to Shanghai's urgent need.

Transportation

The prosperity of a cosmopolitan city depends on transportation as much as it depends on power supply. The expansion of Shanghai's transportation facilities should be directed to two ends. The first is to be design and execute a system of transportation which coordinates harbor, railways, and airways, thus providing appropriate connections with other parts of China and the world. The second is the local transportation system, with the primary aims of providing fast, efficient, and cheap cargo and passenger transport services.

A correlated development of harbor and railway transport will save much of the port expenses now spent as handling charges, lighterage fares, and possibly demurrage expenses. Wen Chao Pang of Woosung offers an excellent location for such a setup. All goods may be loaded or unloaded here, and the direct access, if the dock system is adopted for building the wharves, to freight trains will reduce the port expenditure to a minimum. The Shanghai Nanking Railway Administration is now building 1800 feet of fixed wharf in Chang Chia Pang, Woosung. This is a good start and I hope it will be followed by many similar schemes.

Lunghua Airport is at present the only field available to commercial planes, with Ta-zang and Kiangwan Airfields serving as military fields. Hungjao Airport may be developed to be an international airfield.

North Station is the center of railway passenger transport now. It is hoped that in future a suitable location in Chapei District may be selected for the construction of a Union Station.

Cause Of Traffic Congestion

The causes of traffic congestion of Shanghai are too complicated to deal in any length here. However, it is plain that the following must be taken to improve the traffic conditions of Shanghai:—

(a) to build more bridges to span the Soochow Creek in coordination with the arterial roads in Chapei to drain off the through traffic.

(b) to increase the number of cheap and efficient common carriers vehicles with the natural elimination of obsolete rickshas and pedicabs.

(c) to unify traffic control. The synchronized traffic lights will no doubt aid much in easing the traffic flow in the central district. Its installation will enable the mass transportation vehicles to start an "Express Service" which will be able to run say, from the Bund to St. Georges without stop.

There is at present an unbalanced state of development of the two banks of the Whangpoo River. Pootung or the other bank of the River is relatively undeveloped, and land value is much lower. Most godowns of the city are however, located in Pootung, while the consuming market is on this side of the River. The importance of a cross-river facility can not be overemphasized. There are three ways of spanning the Whangpoo River, by means of bridge, tunnel, or efficient ferry service. Pending large funds to build either of the first two, we can, for the time being, resort to the third. For that purpose a vehicular ferry service was installed since last October, affording much facility to cargo transportation from one bank to the other.

In conclusion, I believe that with the general situation of China improved, the successful consummation of the three will undoubtedly bring much prosperity to Shanghai.

(China Daily Tribune, January 25, 1948)

5. TABLE SHOWING THE INDICES OF THE
DEVELOPMENT OF UTILITIES OF SHANGHAI

Base: October, 1945=100

TIME	Water Consumption	Electricity Consumption	Gas Consumption	Telephone Calls	Tram Passengers	Trolley Passengers	Bus Passengers	Ferry Passengers
Oct., 1945	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Nov. ,	97.9	139.2	137.2	106.2	103.7	96.8	147.9	78.1
Dec. ,	95.7	200.6	182.5	103.8	120.2	115.3	228.9	209.7
Jan., 1946	104.4	251.3	191.6	108.4	80.7	75.7	221.7	250.5
Feb. ,	109.0	254.0	210.6	115.9	89.8	94.2	302.4	219.3
March ,	110.4	341.0	209.1	126.4	106.4	106.9	447.5	301.8
April ,	117.8	385.7	244.1	126.5	121.6	107.7	463.4	398.5
May ,	136.8	392.2	250.7	123.4	97.4	91.7	361.4	381.1
June ,	149.5	430.0	260.0	123.6	111.7	102.6	400.2	376.5
July ,	161.5	429.8	246.2	124.2	113.9	102.0	548.6	391.8
Aug. ,	191.0	477.1	259.8	124.2	123.9	105.6	641.0	442.1
Sept. ,	193.8	485.8	246.7	128.8	117.3	102.1	860.9	424.0
Oct. ,	174.1	513.7	239.9	136.4	121.3	129.1	1004.0	566.0
Nov. ,	165.9	563.4	260.2	132.9	116.1	128.8	978.0	557.9
Dec. ,	152.1	536.0	284.0	133.7	103.0	112.6	1022.0	456.6
Jan., 1947	144.6	546.7	291.3	138.0	95.5	110.8	1103.2	475.9
Feb. ,	146.9	591.2	289.0	129.2	96.6	111.7	1151.6	439.4
March ,	144.6	607.8	270.8	140.0	115.6	131.8	1432.9	582.6
April ,	167.2	627.1	303.1	140.0	118.9	136.2	1607.9	608.8
May ,	175.6	627.3	292.4	149.1	122.9	144.3	1780.2	620.7
June ,	183.8	634.5	309.1	151.1	113.9	130.2	1661.1	556.9
July ,	204.5	629.2	293.2	149.5	96.7	95.5	1206.4	391.3
Aug. ,	229.8	642.5	261.0	137.9	93.7	89.1	1250.3	371.2
Sept. ,	230.4	666.2	255.6	140.9	93.8	92.9	1480.7	424.7
Oct. ,	214.3	684.8	264.0	150.9	99.4	101.9	1516.2	451.7
Nov. ,	189.1	683.9	292.6	145.1	93.9	92.6	1164.4	440.0
Dec. ,	178.1	680.5	295.2	143.5	96.4	103.4	1353.4	500.6
Jan., 1948	185.5	721.2	298.0	141.3	93.7	98.9	1421.8	582.2
Feb. ,	171.6	616.0	274.8	136.0	85.6	85.6	1382.8	503.4
March ,	160.6	678.4	255.1	137.7	102.3	94.0	1463.4	552.1
April ,	183.5	706.2	270.1	143.0	97.2	87.1	1326.8	534.0
May ,	195.6	650.1	246.3	136.0	95.0	85.1	1239.7	475.6
June ,	205.6	655.6	247.6	142.4	93.6	90.1	1319.8	434.7
July ,	224.6	658.5	235.9	142.0	88.1	84.0	1128.8	406.6
Aug. ,	242.9	650.1	230.7	133.2	68.4	61.2	802.0	334.8
Sept. ,	232.0	642.4	234.2	108.7	90.4	104.0	1354.0	397.5

Chart Showing the Indices of the Development of Utilities of Shanghai (I)

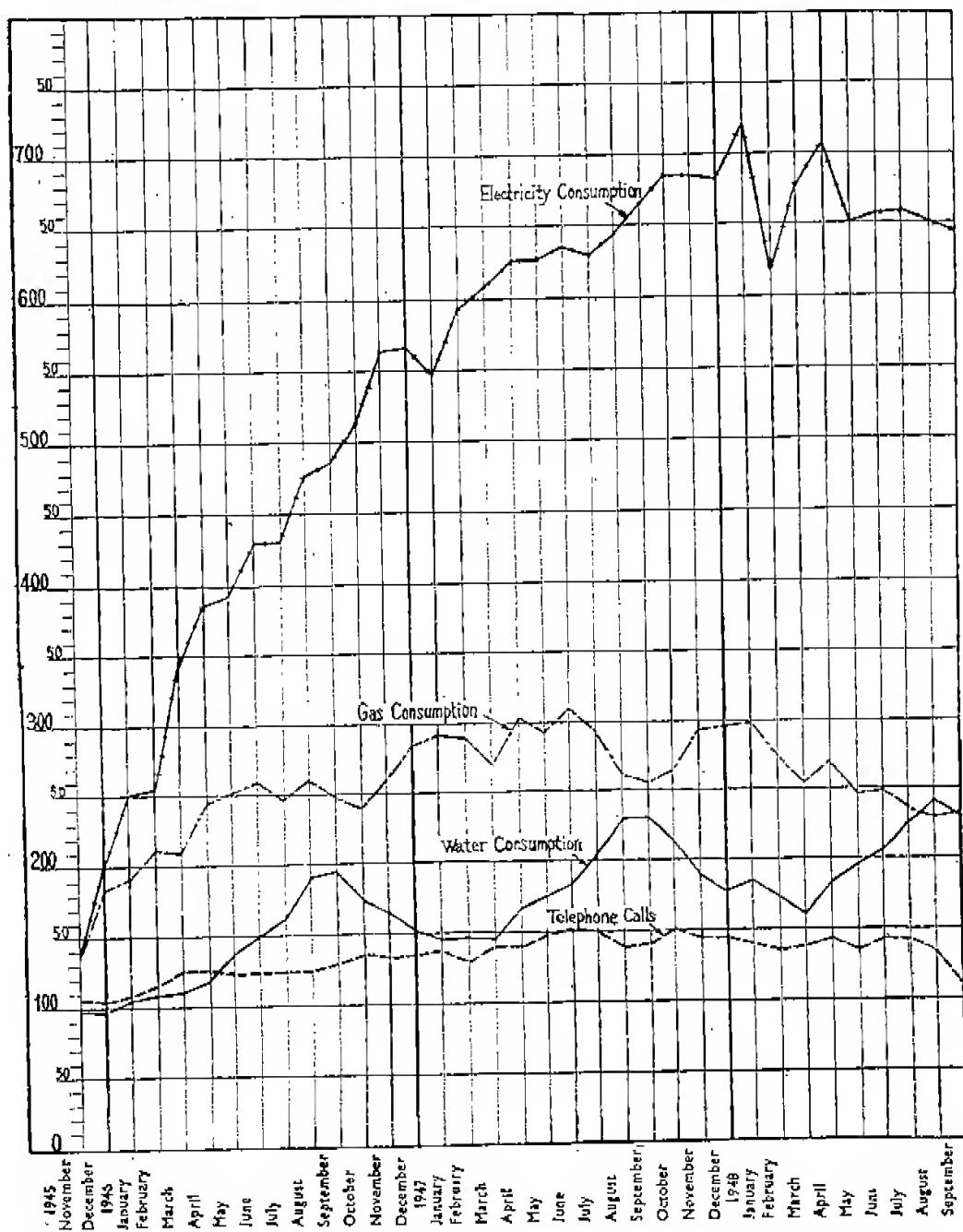
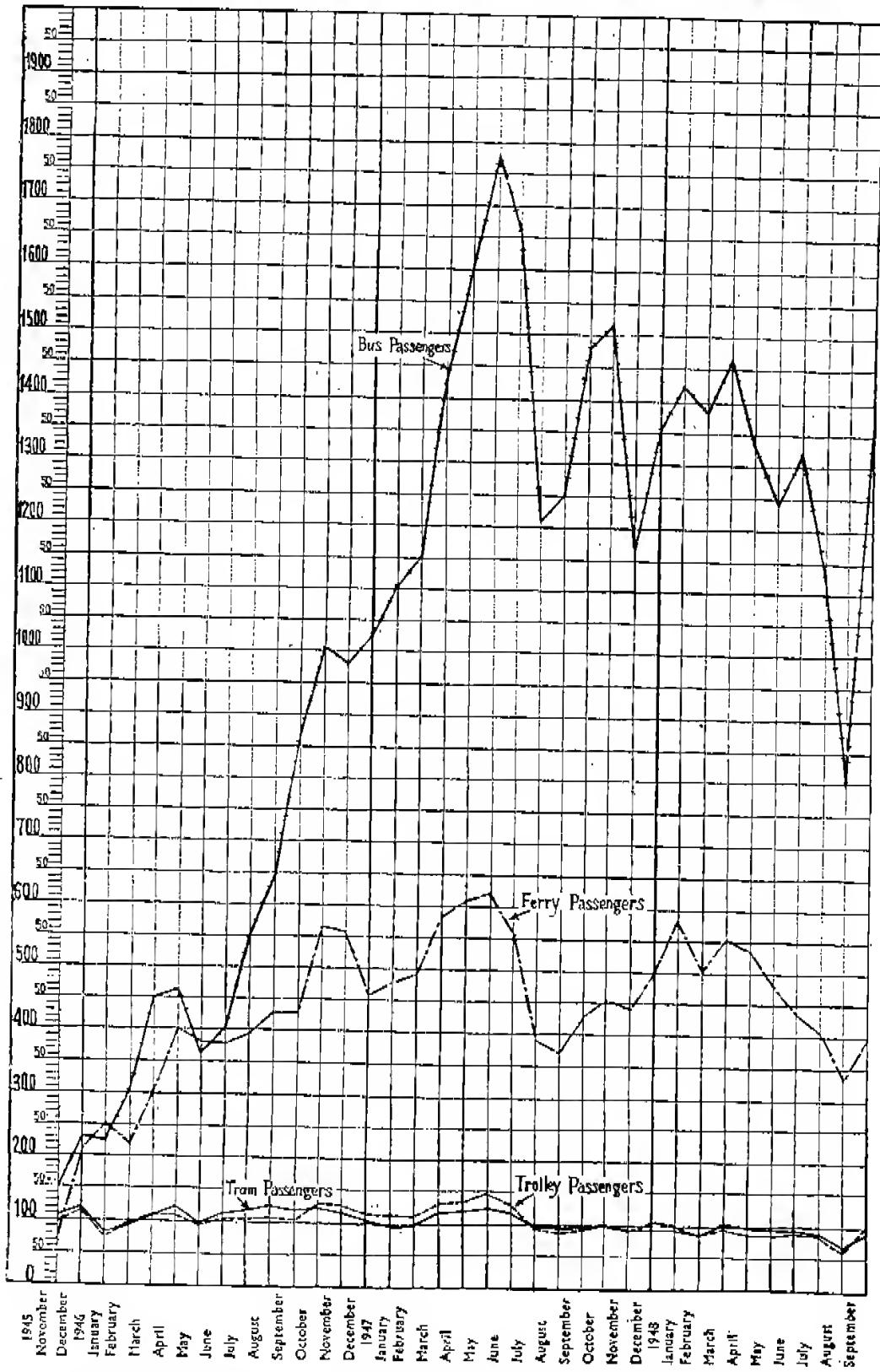


Chart Showing the Indices of the Development of Utilities of Shanghai (2)



PART II WATER SUPPLY

1. REHABILITATION OF SHANGHAI'S WATERWORKS 1948

1. Pootung Waterworks

A. To increase the efficiency of water supply and to avoid possibility of interruption of supply when electric power is cut off, the Company in February of this year installed a gasoline pump with a capacity of 3,500 g.p.m.

B. The chlorinator ordered from the United States and installed in June 1948 adds much to the efficiency of chlorination.

C. Water supply to ships anchored in the harbor began in January of this year and up to now amounted to over 30,000 tons.

2. Shanghai Inland Waterworks Company

A. The 700 h.p. clear-water pump was first connected with Pumps No. 5 and 6 and then connected to the 760 mm. main, capacity being 12,800 g.p.m.

B. A 150 h.p. intake pump is being installed.

C. Three gasoline pumps were installed the functions of which can be seen from the following table:

Item	Unit	No. 1 Pump	No. 2 Pump	No. 3 Pump
Diameter	inch . . .	10	10	10
Power	horse power .	220	202	181
Capacity	g.p.m. . . .	3500	3000	2500
Head	feet	200	200	200
R.P.M.	1150	1150	1150

D. The 450 mm. main along South Station Road was straightened. The main formerly was made a detour because of the South Railway Station. Since the South Station is not to be restored, the main was straightened, passing through the Station and railway. The work was completed on April 18, 1948 resulting in improved water pressure conditions in Lao-si-meng.

E. 450 mm. pipes were laid along Chinkee Road to help the water supply in the Western District. The pipes started from Chinkee Road, corner of Siatu Road, ended at Chinkee Bridge, and had a total length of 663 meters. The work was completed on June 21, 1948, and will enable the Company to supply to the Western District 13,000 to 15,000 cubic meters of water daily, when the boosting station is ready to work.

F. 200 mm. and 150 mm. pipes were laid with a total length of 1,842 meters solely to improve the water supply to the Lung-hua Airport. The laying was finished in September 3, 1948.

3. Chapei Electricity and Waterworks Company:

A. The Company's plant adopted "primary chlorination" this year. Before adding alum to raw water for coagulation, the raw water is treated with adequate quantities of liquid chlorine or bleaching powder. This would improve the quality of water and save the consumption of alum.

B. Heng Foong Road Pumping Station was restored in July, 1948. The storage capacity is 8,500 cubic meters. Two electric motive pumps of 95 h.p. and 15 h.p. respectively were installed. Total output capacity is 4,500 g.p.m.

4. French Waterworks Company:

A. The 1,200 m³/hr. intake pump was changed to a 3,000 m³/hr. pump.

B. A clear water pump is being installed, with a capacity of 3,600 m³/hr.

5. Shanghai Waterworks Company:

A. New main across Chapoo Road Bridge replacing Kiangse Road aqueduct was completed.

B. By-pass culvert between Nos. 4 and 5 intakes is being constructed.

C. An alum solution feed plant is being constructed.

D. Equipments of Nos. 23 and 25 rapid filter are being installed.

E. Two new pumps were ordered from London, England. One is a main electric pump with a capacity of 10,000 g.p.m. and will arrive in Shanghai next year. The other one is a primary diesel pump of capacity 25,000 g.p.m. and will be delivered in 1950.

PRODUCTION OF WATER

	Production (cub. m.)	Sales (cub. m.)	Losses
Pootung,			
August, 1947	112,900	99,044	12.3%
August, 1948	147,907	118,999	19.5%
Amount of Increase . . .	35,007	19,955	7.2%
Inland,			
August, 1947	2,885,950	1,871,510	35.0%
August, 1948	3,186,380	2,252,550	29.0%
Amount of Increase . . .	300,430	381,040	- 6.0%
Chapei,			
August, 1947	2,185,731	1,630,670	25.4%
August, 1948	2,206,719	1,781,817	19.3%
Amount of Increase . . .	20,988	151,147	- 6.1%
French,			
August, 1947	3,337,166	2,996,019	10.2%
August, 1948	3,417,968	3,039,408	11.2%
Amount of Increase . . .	80,802	43,389	1.0%
S.W.W.,			
August, 1947	11,174,600	7,949,400	29.0%
August, 1948	10,481,000	8,226,000	21.5%
Amount of Increase . . .	-693,600	276,600	- 7.5%
Total production			
August, 1947	19,696,347	14,546,643	26.1%
August, 1948	19,439,974	15,418,774	20.6%
Amount of Increase . . .	-256,373	872,131	- 5.5%

2. DEVELOPMENT OF WATER SUPPLY FOR THE WESTERN DISTRICT

Water for the Western District had been supplied by the Shanghai Waterworks Company. Due to the small sizes of distributing mains leading to the Western District and the great distance between the Company's plant and the District, both quantity and pressure of water were insufficient. Since the Western District Water Supply Planning Office, under the direction of the Bureau of Public Utilities, started its emergency projects, 3 deep artesian wells were driven along Hungjao Road and one reservoir was built in Great Western Road in 1947. The new source of water appreciably increased the quantity and pressure of water and improved the supply conditions in the south-west section of the Western District, such as Hungjao Road, Fahua Road, Huashan Road, Panyu Road, Wuyi Road, and a part of Chungcheng Road (Western). In addition, water supply was extended to more than 200 new consumers.

The essence of the emergency projects for the present year of 1948 is to effect a connection with the Inland Waterworks. The plan consists of laying 18" pipe along Chinkee Road and Wanping Road to connect with the 18" pipe of Inland Waterworks along Siatu Road, the 24" pipe of the French Company along Hengshan Road and Fuming Road and the 12" pipe of the Shanghai Waterworks Company along Chungcheng Road (Western) to form a special pipe for transmission of water. Then the surplus water of the Inland Waterworks may be channeled thereby to the pumping station and reservoir at Chungcheng Road (Western). The special pipe has a total length of 10 kilometers. The loss of water pressure along the pipe is high. It is necessary to build another pumping station at Siatu Road, west of Lu Pan Road, so that water pressure and quantity may be raised. Actual construction was started in April. Up to the present, the house for the Siatu Road pumping station was completed. Pipes, fittings, safety valves, and electrical equipments were all purchased. Three sets of pumps totalling 250 horse power have been ordered from local factory and are now under installation. The pipe bridge crossing the Zikawei Creek was finished, the 18" pipe laying along Wanping Road was also completed. Other engineering jobs to be completed as connecting pipes for the Siatu pumping station, the Venturi meter at Chinkee Road, the additional pipes for the Chungcheng Road reservoir and pumping station, etc., can be completed within two months after the procurement of necessary material within the year of 1948.

After the consummation of the whole project water available from the Inland Waterworks will mark an increase of 7,000 tons daily which will be sufficient for an additional 80,000 people. Then the water shortage in the central section of the Western District can be greatly alleviated.

(September 24, 1948)

3. WESTERN DISTRICT WATER SUPPLY PROBLEM

(A) Emergency steps taken by the Public Utilities Bureau in facilitating the water supply in the western district are furnishing additional supplies to 120,000 residents in that area, Dr. T. C. Tsao, Commissioner of Public Utilities, reported at a municipal conference recently.

Several districts in western Shanghai have been opened to new water consumers, who have been handicapped by the lack of pipelines as well as low pressure of water in the past. Commissioner Tsao pointed out that the western district, being the former extra-Settlement area, had no planning for future development as far as the development of utility facilities was concerned.

In Deplorable Condition

Throughout the years, numerous residences, shops and factories were built in that area. With the thin pipelines and the distance of the area from the Yangtze River waterworks, water supply in that area has been in a deplorable condition. Many had to dig native-type wells to augment the water supply, Dr. Tsao asserted.

A new department was created by PUB in November 1946 to plan for the improvement and expansion of water supplies. With a sum of \$1,500,000,000 allotted by the City Government, initial work was done in the early summer of last year.

Measures taken are as follows:

(1) Three artesian wells were dug in the Hungjao district. As a result, water pressure there was increased by more than 40 feet, and more than 200,000 gallons are added to the supply every day. Sixty new consumers were called for from the public in that area.

(2) A reservoir and pumping station was constructed last year near Great Western and Hua-shan Roads. Water is pumped and stocked up during the night, and supplied to the pipelines during the day. One hundred new consumers were thus allowed in that area.

(3) For the benefit of the poor in the above areas, and with the subsidies given by the U.S. China Relief Mission to the Public Health Bureau, public water plugs are being installed there to furnish free water for reasons of public health.

(4) One disused artesian well of the Shanghai Waterworks is being renovated to improve the water supply along Yu Yuen Road.

(5) A nine-kilometer pipe is linking up the Nantao and former Settlement waterworks systems, so that surplus supply from Nantao may be switched to the western district.

(China Press, May 29, 1948)

(B) An emergency scheme to divert a surplus of 13,000 to 20,000 cubic meters from the Inland Waterworks in Nantao to the western district will be completed by the Public Utilities Bureau this year, PUB Commissioner T. C. Tsao announced yesterday.

"My policy of developing the utilities of Shanghai is to have the first thing first. Among all the utilities, the most important is electric power for which the Mayor and I have been endeavoring our best to push the United Power Company project. Of equal importance is the water supply, for the improvement of which we are working continuously, with special emphasis on the supply in the western district," he said.

"The solution of the problem of water supply in the western district is two-fold, that of the expedient and that of the permanent. The permanent solution has been under planning and promotion, but its realization may take years to come. It is the expedient solution that we are at present specially interested and there must be no time lost for its materialization," he continued.

Constructions Detailed

The main principle adopted in the emergency scheme for this year is to utilize the surplus water amounting to 13,000 to 20,000 cubic meters per day produced by the Inland Waterworks for use in the western district. The following is its necessary engineering constructions:—

1. Water pipe along Wanping Road. The Inland Waterworks has 18-inch pipes along Siatu Road. From this point more 18-inch pipes will be laid along Chinkee Road, Wanping Road, to West Hingkwo Road. Some 600 meters of pipe along Kinkee Road will be laid by the Inland Waterworks. The remaining 400 meters will be laid by the Bureau of Public Utilities.

2. Repumping station at Siatu Road. The main along Siatu Road surplus water but there is not enough pressure. A re-

pumping station will be built near Looban Road to increase the pressure so that water may be distributed to the reservoir at Chungcheng Road, Western. The station will be equipped with two 90 h.p. and one 65 h.p. electric pumps, capable of pumping 2,220 and 1,590 gallons per minute respectively. The station will be further equipped with two petrol pumps provided by the Inland Waterworks and capable of pumping 1,400 gallons per minute. The head of all pumps is 30 feet. Three pumps will be used, leaving two as reserve.

3. Water meter station. A water meter station with one 13-inch Venturi Meter will be built near the Chinkee Road Bridge to record the quantity of water.

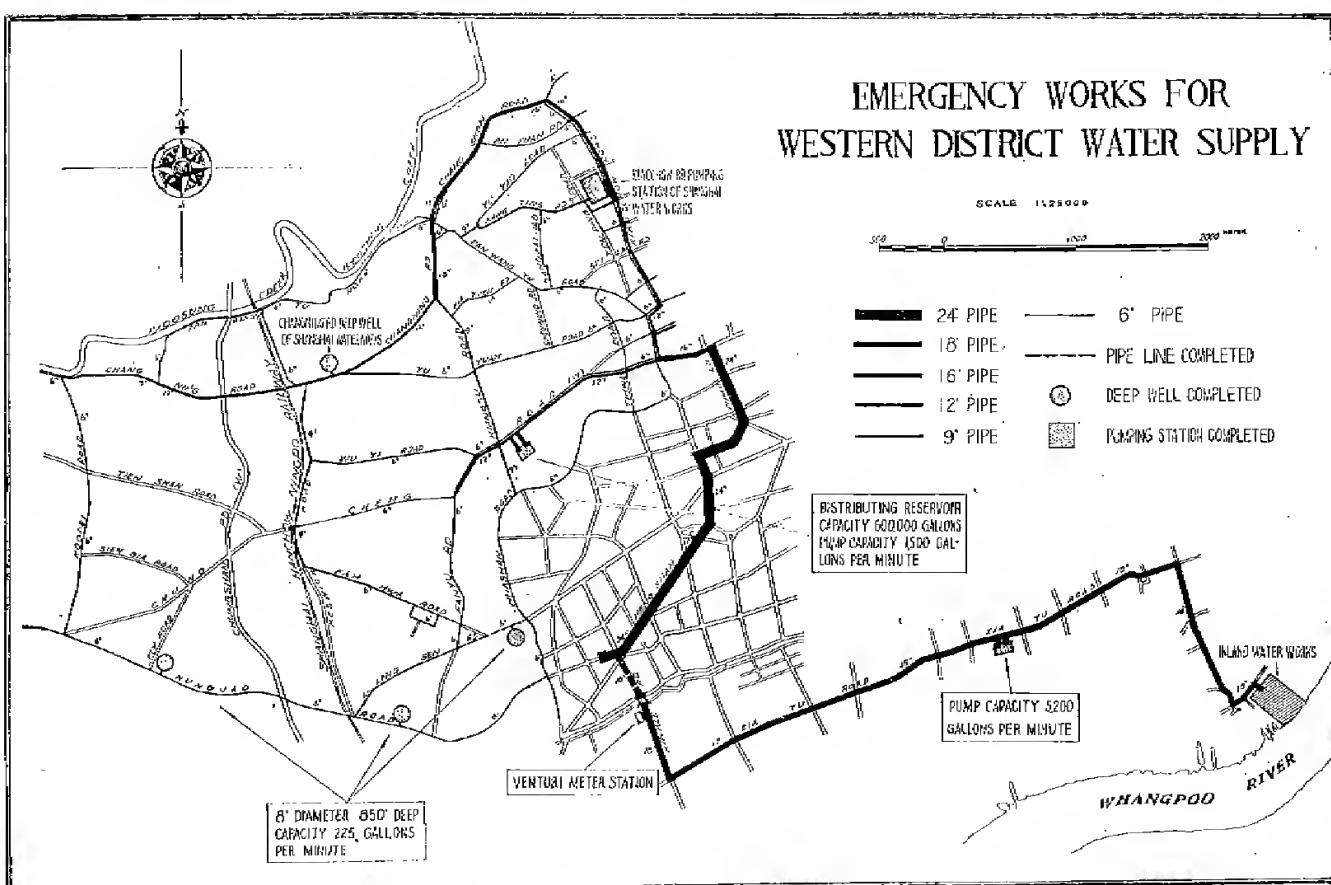
4. Reservoir and pumping station at Chungcheng Road (Western). At 730 Chungcheng Road (Western) a new reservoir will be built with a capacity of 1,000,000 gallons, supplemented by three high-lift pumps with two 12-h.p. motors and one 80-h.p. motor, capable of pumping a total of 7,600 gallons per minute.

5. Water pipe along Hingkwo Road. 16-inch pipes with a total length of 2,500 meters will be laid to reach the western district through Wanping, Yuking, Hingkwo, and Kiangsu Roads. Before the completion of the above, the 24-inch pipes formerly laid along Hengshan Road and Fumin Road of the French Waterworks and the 12-inch pipes along Chungcheng Road (Western) of the Shanghai Waterworks will be utilized.

"With the completion of the five steps, water production available for the western district will be boosted by 3,300,000 to 4,000,000 gallons per day. In addition to the 1,100,000 provided by the three deep artesian wells already in operation at Huashan, Hungjao and Panyu Roads, water available for the populace of the western district will be around 5,000,000 gallons per day," the PUB chief concluded.

(The China Press, January 16, 1948)

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4. STATISTICS OF WATER SUPPLY

January, 1946—September, 1948

Unit: Cubic Meter.

TIME	Production	Consumption	Average Daily Production	Average Daily Consumption
January, 1946	10,513,000	6,622,713	339,129	213,636
February	10,478,490	6,903,350	374,232	246,548
March	10,957,796	7,022,655	353,477	226,537
April	11,744,362	7,464,459	391,479	248,815
May	12,009,050	8,670,272	387,389	279,686
June	13,461,500	9,481,341	448,710	316,045
July	14,719,544	10,228,054	474,824	329,937
August	16,979,006	12,091,622	547,710	390,052
September	16,417,088	12,274,959	547,236	409,165
October	15,262,056	11,021,076	492,324	355,519
November	15,190,488	10,508,317	506,350	350,277
December	14,747,897	9,631,546	475,739	310,695
January 1947	15,026,600	9,384,876	484,729	302,738
February	13,912,936	9,510,046	496,891	339,644
March	13,776,901	9,118,707	444,416	294,152
April	14,971,975	10,642,177	499,066	354,739
May	15,387,343	10,075,514	496,366	357,268
June	16,221,583	11,542,743	540,719	384,758
July	17,620,427	12,856,926	568,401	414,739
August	19,512,070	14,365,243	629,422	463,395
September	19,513,344	14,526,854	650,445	484,228
October	18,426,869	13,485,544	594,415	435,018
November	17,874,868	11,899,586	595,829	396,653
December	17,223,551	11,207,191	555,598	361,522
January 1948	17,388,474	11,713,009	560,918	377,839
February	16,784,177	10,874,688	599,435	374,989
March	16,547,318	10,176,479	533,784	328,273
April	17,210,032	11,620,631	573,668	387,354
May	16,984,891	12,391,965	547,900	399,741
June	17,522,819	13,020,418	584,094	434,014
July	18,641,330	14,224,103	601,333	458,842
August	19,396,857	15,375,657	625,705	495,989
September	18,402,430	14,690,506	613,414	489,683

PART III ELECTRICITY

1. POWER SUPPLY IN THE YEAR 1948

1. Increase of Generating Capacity

(1) Shanghai Power Company

The generating set of 25,000 kw capacity ordered from Switzerland was transported to Shanghai and installed. Power generation has commenced since December 1, 1948.

(2) Chinese Electric Power Company

The two generating sets of 2,000 kw each purchased from CNRRA are being installed. If the parts of the sets can arrive as expected, installation may be completed before the end of this year and generation may start.

(3) French Company

The 3,000 kw diesel generating set, transported to Shanghai in spring, can start generation at the end of October.

(4) Pootung Electric Supply Company

The two 350 kw sets of diesel generators rented from the Heng Feng Cotton Mill generated electricity in January. The Company's 600 kw steam generator set looted by the Japanese was restored to the Company and is being installed. The Nan Hwei Power Company which used to buy bulk power from the Pootung Electric Supply Company has started generating power itself by a new 800 kw generating set purchased from CNRRA. This also improves the power supply situation of the Company.

2. Increase of Industrial Power Supply

In January there was a total number of 17,477 consumers.

In July there was 17,903 consumers in Shanghai, an increase of 426 consumers aggregating 15,000 kw.

3. Setting up More Transmission Lines

The Pootung Electric Supply Company has completed the building of transmission line from Kao Chiao to Tu Family Temple. The Chapei Company has extended its transmission network to Tsao-yang.

2. STATISTICS OF POWER SUPPLY

January, 1946—September, 1948

Unit: k.w.h.

TIME	Production Kwh	CONSUMPTION							
		Total		Residential & Commercial Consumption		Industrial Consumption		Utility Consumption	
		Consumption	%	Consumption	%	Consumption	%	Consumption	%
January, 1946	42,761,358	32,638,175	100	6,708,340	21.0	21,535,239	65.7	3,957,586	12.0
February	40,739,614	33,449,192	"	11,370,553	34.0	18,258,075	54.6	3,204,017	9.5
March	56,845,893	44,894,839	"	12,417,558	27.7	27,508,271	61.3	4,244,362	9.4
April	57,923,676	50,749,787	"	12,667,779	25.0	33,556,403	66.0	3,828,151	7.6
May	62,370,957	51,670,964	"	12,438,825	24.1	34,832,199	67.4	3,740,603	7.2
June	62,569,418	56,565,307	"	12,987,372	22.9	38,969,731	69.0	3,975,944	7.0
July	68,645,181	56,529,969	"	13,286,895	23.6	38,386,939	67.8	4,165,886	7.1
August	70,420,451	62,776,893	"	15,276,189	24.3	42,201,664	67.3	4,512,801	7.2
September	71,788,101	63,895,657	"	16,178,763	25.3	42,691,314	66.8	4,285,915	6.8
October	80,389,261	67,582,794	"	17,049,599	25.2	45,195,975	66.9	4,393,134	6.5
November	81,388,107	74,111,977	"	18,791,930	25.3	50,006,188	67.5	4,369,242	5.9
December	87,601,945	74,449,628	"	17,978,345	24.2	51,012,099	68.4	4,531,135	6.1
January, 1947	82,222,777	71,906,241	"	20,892,481	29.1	45,461,365	63.2	4,610,719	6.4
February	87,326,694	77,777,877	"	23,298,819	30.0	49,227,067	63.3	4,365,903	5.6
March	93,414,210	79,927,637	"	21,236,074	26.6	53,038,970	66.3	4,808,895	6.0
April	91,146,197	82,514,499	"	20,902,924	25.3	55,887,750	67.7	4,930,982	6.0
May	93,218,886	82,551,611	"	20,478,613	24.8	56,445,103	68.4	4,845,990	5.9
June	90,658,369	83,498,187	"	19,899,810	23.8	57,833,453	69.3	5,051,649	6.0
July	94,159,269	82,815,936	"	20,691,858	25.0	55,825,865	67.4	5,435,373	6.6
August	93,548,124	84,550,839	"	21,122,642	25.0	56,911,401	67.3	5,534,831	6.5
September	97,829,363	87,683,856	"	20,136,497	23.0	61,067,718	69.6	5,398,932	6.2
October	101,456,804	90,115,407	"	20,832,573	23.1	62,672,524	69.5	5,387,443	6.0
November	98,114,988	90,000,098	"	18,922,987	21.0	64,473,824	71.7	5,331,164	5.9
December	107,223,931	89,551,104	"	18,917,911	21.1	63,804,466	71.3	5,564,462	6.2
January, 1948	106,855,832	94,920,787	"	21,934,249	23.1	66,216,642	69.8	5,434,370	5.7
February	86,683,360	81,070,005	"	20,653,389	25.5	54,298,518	67.0	5,089,677	6.3
March	104,878,879	89,288,547	"	18,811,104	21.1	64,044,985	71.7	5,413,251	6.1
April	99,682,290	92,948,280	"	19,765,184	21.3	66,823,055	71.9	5,340,785	5.7
May	98,626,032	89,543,522	"	17,978,922	21.0	61,325,209	71.7	5,245,494	6.1
June	95,497,044	86,284,221	"	18,814,723	21.8	61,101,704	70.8	5,361,935	6.2
July	99,225,305	86,581,161	"	20,123,759	23.2	59,923,125	69.3	5,828,224	6.7
August	95,225,819	85,542,575	"	20,784,318	24.3	58,160,577	68.0	5,931,864	6.9
September	95,949,084	84,536,527	"	20,345,355	24.1	57,764,170	68.3	5,828,527	6.9

PART IV GAS SUPPLY

1. HIGH PRESSURE GAS MAIN INTERCONNECTION BETWEEN WOOSUNG GASWORKS AND SHANGHAI GAS COMPANY

Gas, like electric power, must be supplied, economically, by high pressure transmission mains to substations, to be distributed by lower pressure mains to individual consumers. Shanghai is served by two gas companies, the Shanghai Gas Company and the Woosung Gasworks. Up to the present time, high pressure transmission mains of the two gas companies are not connected. The main of the Shanghai Gas Company starts from the Company's plant at Yangtzeppo and passes Hokien Road, Hwoshan Road, and Tangku Road (Boone Road) to the Company's storage tank at Ni Cheng Chiao. The main of the Woosung Gasworks runs from north to south, passes the new municipal district at Kiangwan, and ends at Ur Yang Road at corner of Szedah Road. There was no main connecting these two high pressure mains with the result that no adjustment of gas supply between the companies was possible. This was evidently detrimental to the development of the city's gas industry. After several technical conference, it was decided to lay an eight-inch pressure tie-in line, starting from the Ur Yang Road pipe line terminal of the Woosung Gasworks, passing through Chek Ziang Road, Shanying Road, Szechuen Road (Northern) to Tien Tung Ou Station of the Woosung-Shanghai Railway, then running along the Railway southward to Jukong Road to turn to Kiangse Road (Northern), reaching Tangku Road (Boone Road), and there connecting with the high pressure main of the Shanghai Gas Company. The connection main has a total length of 11,100 feet.

The inter-connection main, when successfully laid, will not only unite the gas supply of the two companies, but also enable the Woosung Gasworks to extend its gas supply to the central district. The laying of the main is being financed by the two gas companies. The 8-inch cast iron pipe and other materials required were purchased in January and February of this year. The laying of the main has been divided in two stages. Work for the first stage was started in June and completed in August. The main laid is 2,960 feet long and ends at Szechuen Road (Northern), corner of Kiangwan Road. The main to be laid in the second stage is 8,140 feet long. Contract for renting the land along the Railway was signed with the Railway Administration. Work may be started as soon as the fund for the engineering

expenses for laying the main is procured. It is expected that before the end of this year, 1948, the whole connection work will be completed. Woosung Gasworks has since its establishment been trying its best to expand the services. At present there is sold by bulk supply to Hongkew consumers 450,000 to 500,000 cubic feet of gas daily. Its production capacity will easily allow a bulk supply sale of 700,000 cubic feet daily but supply is limited due to the small size of transmission pipes, there being only two 6-inch low pressure pipes in the Uryang Road governor house outlet. Now the first section of the inter-connection main is already laid and high pressure gas can be sent to the end of Szechuan Road (Northern). Low pressure grid at that place composes of five 9-inch and 12-inch pipes. It is proposed to build an underground governor house at Shanying Road so that the bulk supply can be increased. The structural materials for the governor house and the governor had been bought and the building, already started, is expected to be finished at the end of September. Bulk supply sale of the Woosung Gasworks can then be further increased. After the completion of the new mechanical producer the daily capacity can be increased to 1,000,000 cubic feet. Surplus gas at night can be sent via the new tie-in line to the storage tank of Shanghai Gas Company at Ni Cheng Chiao. In 1949, if the retort repair work of the Shanghai Gas Company can be completed, the total daily gas supply capacity can be six million cubic feet (including 2,000,000 cub. ft. of water gas). The coke oven gas supplied by the Woosung Gasworks will reach the figure of 1,200,000 cubic feet daily. The total capacity of the two companies will thus mark a 40% increase over the present figure. Consequently the number of consumers and the areas to which gas can be supplied may be proportionally increased.

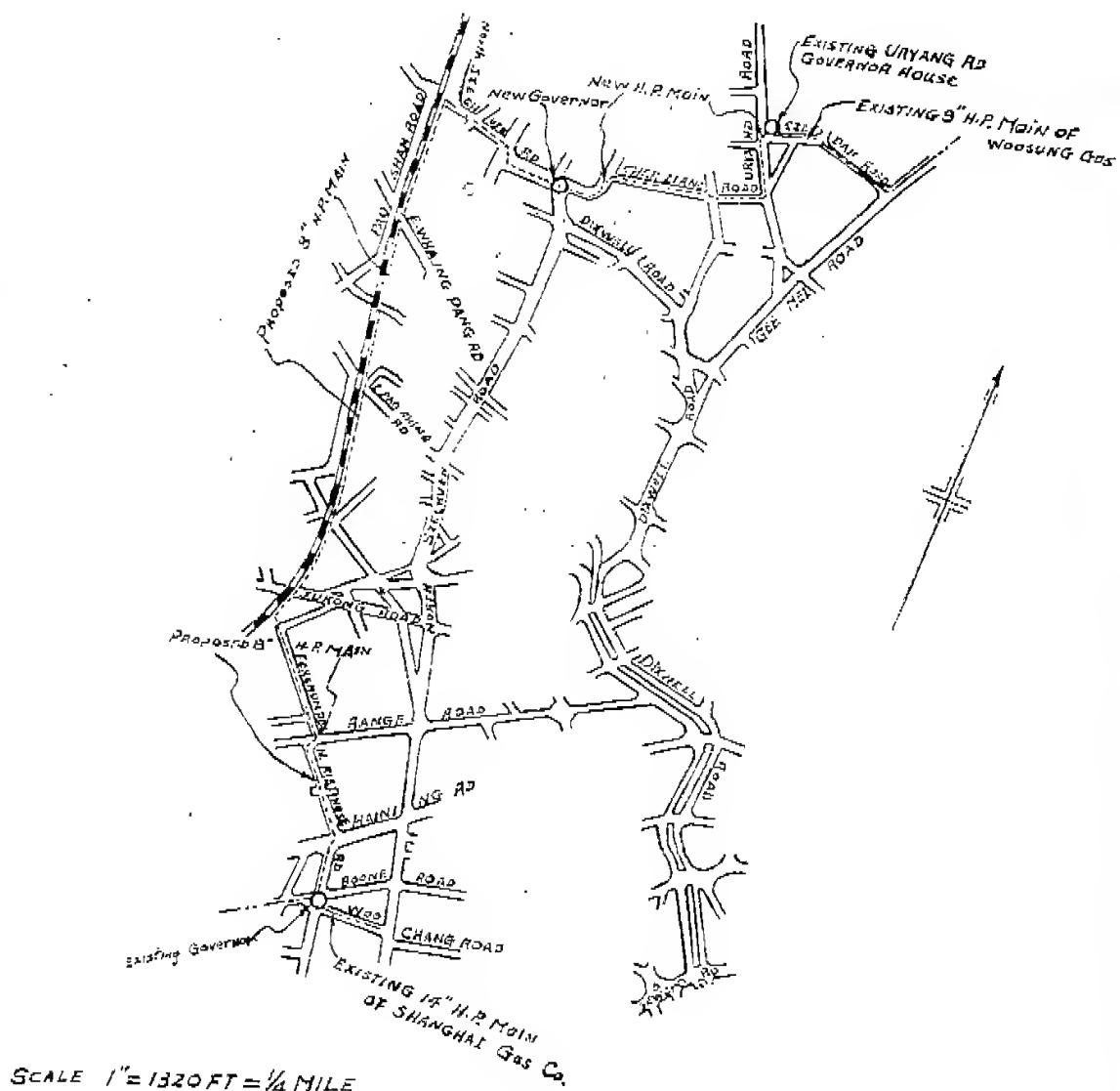
NEW H.P. GAS MAIN
TO CONNECT

SHANGHAI GAS COMPANY SYSTEM TO WOOSUNG GAS WORKS MAIN

----- *New H. P. Main*

EXISTING H-P MAIN

○ Governor



(32)

2. REHABILITATION OF THE SHANGHAI GAS COMPANY

1. Development of Gas Sales:

The increase in Gas sold during the past twelve years is shown in the following table:—

Year	Total Gas Sold
1947	1,463,155,171 cu. ft.
1946	1,227,513,049 "
1940	1,158,166,512 "
1939	995,054,234 "
1938	724,501,056 "
1937	746,172,372 "
1936	880,801,129 "

A small oil gas unit of 230,000 cu. ft. per day capacity has been designed and put into operation. This plant is being extended to 1,000,000 cu. ft. per day. The admission of controlled quantities of air into the base of the vertical retorts resulted in a considerable increase in coal throughout and gas production from the installation and also resulted in improved operation of the gas producers and increased yields of by-products in spite of the inferior quality of coal available for carbonizing during the year.

The capacity of the steam-raising equipment was increased to meet requirements by the installation of a simple oil-firing equipment as a auxiliary to solid fuel firing.

2. Distribution:

Bulk Supply of Gas to Nantao:

Arrangements were made to extend the supply of gas to the official residence of the Bureau of Public Utilities in Nantao, and this supply was made available in June 1948.

3. High Pressure Main Linking Woosung Gas Works

High Pressure Distribution System and The Shanghai Gas Company Distribution System:

The work of laying this main commenced early in July 1948 and to date approximately 3,100 feet of main has been laid.

4. Employees Welfare:

Two clinics have been established for the employees of the Company, one at the Yangtze Poo Works and the other at the Head Office with a staff in attendance, comprising a foreign trained doctor and assistant with two qualified nurses. Employees also have facilities for medical treatment by three recognized native trained doctors of good standing.

A special welfare allowance to workers in the form of addition to the basic wage to cover medical services for workers' families, works' co-operative society and schooling for employees' children was also granted.

5. Year 1949:

During 1949 it is proposed to reset 16 (sixteen) vertical retorts and 3 (three) producer gas units.

It is also proposed to install an electrostatic detarrer which should result in considerable economies in the cost of purifying the gas.

6. Future Development of Gas Sales in Shanghai:

The maximum total gas output recorded so far was 5,263,000 cu. ft. on December 20th, 1947.

When adequate supplies of coal are again available in Shanghai, the extension of the Gas Company gas manufacturing plant with an installation of 30 vertical chamber ovens is projected which will increase the total capacity of the plant to 8,000,000 cu. ft. per day.

3. REHABILITATION OF WOOSUNG GASWORKS. 1948

1. Coke Oven:—The Gasworks was previously in possession of thirty coke ovens. There were, however, only fifteen which were operable at the time of the "take-over." An additional five were repaired and added to service in the year 1946. Ten more ovens were repaired at the beginning of 1947. The thirty ovens went through a major overhaul which was completed at the end of October 1947, and are now being operated day and night to produce gas.

2. Producer:—The original design of the Gasworks provided two producers for five coke ovens. There were originally 12 producers, of which only 4 were left in normal condition at the time of the "take-over." The 8 dilapidated ones were repaired together with the coke ovens. Some improvements were made and steam is adopted to inject air.

3. Sulfur purifier:—The original sulfur purifier had too small a capacity, only supplying sufficient to purify 300,000 cubic feet per day. Due to the increase in productive capacity of gas there were built four new sets of sulfur purifier which would be able to purify 1,200,000 cubic feet of gas daily.

4. Mechanical producer:—The Gasworks originally employed producers to heat up the coke ovens. This involved more work and the heat produced was rather unsteady. After a thorough investigation it was decided to install a mechanical producer to serve all the coke ovens. The installation of the mechanical producer may be completed before the end of this year.

5. Coal elevator, coal washing machine, and scrubber:—The original coal elevator, coal washing machine and scrubbers were all in a dilapidated state and have, since being taken over, gone through major cleaning and repair. A new coal elevator was built to increase the efficiency of transporting coal. The scrubber is used to remove ammonia in the gas. As the volume of the old one is rather small a new one has been built.

6. Gas holder:—The old gas holder of the Gasworks has only a capacity of 100,000 cubic feet and proves to be insufficient for storing the gas produced. At present the gas produced in the day time has mainly been transmitted to Shanghai consumers. The volume of the holder must be increased in future when more production is made. It is planned to order a 1,000,000 cubic feet gas holder from the States and to construct high pressure mains to connect with the mains of the

Shanghai Gas Company so that gas produced during night time may be stored therein.

7. Mains:—The total length of high pressure mains possessed by the Gasworks previously was 13,240 meters and that of low pressure mains 11,869 meters. The high pressure mains started from the Gasworks and ended at Ou-yang Road. 12,000 meters of high pressure main is now being laid starting from Ur-yang Road and ending at Tangku Road to connect with the high pressure main of the Shanghai Gas Company.

8. Compressor:—Compressor is an essential equipment for transmitting gas. There was only one compressor taken over, which after being repaired was insufficient. In 1947 one more unit was built. The present transmitting pressure is 4.5 pounds. The pressure may be increased to 12 pounds when future expansion of production demands.

9. Artesian well:—The site of the Gasworks is at a considerable distance from the nearest water source. Water used by the Gasworks has been obtained from artesian wells. There was originally one artesian well which after eight years of use had its water source weakened. In June 1947 a new artesian well was dug to supply 15,000 gallons of water per hour.

10. Miscellaneous:—Other improvements of equipments of the Gasworks included transportation, coal conveying, electrical generator, coal tar distillation, etc. Recently, research work of manufacturing ammonia sulphate out of ammonia is being conducted.

4. IMPROVEMENT OF GAS SUPPLY

Dr. T. C. Tsao, Commissioner of Public Utilities, yesterday morning reported to the 129th Municipal Conference on PUB's efforts for improvement of the gas supply, the SMG Press Bureau reports.

Dr. Tsao stated that in pre-war days there were only a few thousand gas consumers using about one and a half million cubic feet of gas daily.

At present there are more than twenty thousand consumers and the daily consumption has increased to 4 million cubic feet. Due to shortage of supply many new applications for gas connection have to be rejected.

Plans To Increase Supply

The Woosung Gasworks under PUB is now producing some 800,000 cubic feet of gas, its maximum capacity. The Gasworks is now ordering a new automatic producer gas plant from U.S.A. which when installed will boost the gas supply to 1,200,000 cubic feet. High pressure mains will be built to coordinate with the installation of the new plant.

The mains will be able to connect with the high pressure mains of the Shanghai Gas Company. Surplus gas production during the night can be sent to be stored in the gas tank of the S.G.C. in Sitzang Road. The plans have been approved by the Mayor and are being under active execution.

(China Daily Tribune, June 5, 1948)

5. STATISTICS OF GAS SUPPLY

January, 1946—September, 1948

Unit: Cub. ft.

TIME	Production	Total	Consumption	
			Residential & Commercial	Industrial
January, 1946	108,416,045	88,556,051	70,919,500	17,636,551
February	108,020,000	97,336,185	79,158,803	18,177,382
March	125,666,976	96,635,762	76,123,462	20,512,300
April	123,034,267	112,789,501	89,806,554	22,982,947
May	129,825,034	115,840,162	90,926,199	24,913,963
June	124,899,166	120,157,564	92,079,273	28,078,291
July	121,764,703	115,362,200	88,926,277	26,435,923
August	120,288,951	116,401,115	90,158,071	26,243,044
September	116,840,141	115,394,853	86,684,374	28,710,479
October	130,285,028	117,210,226	85,326,419	31,883,807
November	135,712,968	126,756,899	89,865,328	36,891,571
December	153,318,172	131,068,476	94,592,492	36,475,984
January 1947	144,493,646	135,797,132	100,188,620	35,608,512
February	139,131,000	134,992,500	100,560,727	34,431,773
March	151,082,000	126,498,200	92,159,400	34,338,800
April	145,955,000	141,301,600	106,654,249	34,647,351
May	143,222,000	136,279,100	102,133,270	34,145,830
June	143,612,000	142,773,800	108,547,870	34,225,930
July	132,545,900	134,051,300	103,309,720	30,741,580
August	122,917,500	120,596,900	97,277,029	23,319,871
September	129,261,000	118,114,500	91,631,591	26,482,909
October	147,172,400	121,891,740	90,079,167	31,901,573
November	149,635,560	135,191,920	96,933,524	38,258,396
December	160,723,000	136,377,770	96,585,207	39,792,563
January 1948	153,530,000	139,741,420	104,982,023	34,759,397
February	129,572,700	127,035,910	96,527,405	30,508,505
March	142,883,000	117,966,390	82,592,654	35,373,736
April	130,568,100	124,865,070	85,124,673	39,740,397
May	126,414,000	113,848,300	77,345,769	36,502,531
June	119,663,800	114,395,700	76,196,669	38,199,031
July	122,888,460	109,031,350	74,909,919	34,121,431
August	112,900,500	106,616,550	77,145,497	29,471,053
September	116,468,400	108,210,750	75,980,780	32,229,970

PART V TRANSPORTATION

1. PROPOSAL FOR ORGANIZING THE SHANGHAI TRANSIT COMPANY, LIMITED

Proposed by S.M.G. and passed in principle by the

City Council in its 7th Session,

September 14, 1948:

1. The Bureau of Public Utilities, carrying out the policy of the Shanghai Municipal Government, has inaugurated a city bus service since V-J Day through the management, provisionally, by the Shanghai Transit Planning Board organized under the Chairmanship of Commissioner T. C. Tsao (known hereafter briefly as the Planning Board). During the 3 years of building up the Bus Service, 3 hundred new buses have been purchased and bodied, public transportation service on 15 routes started, with the result that the rough framework of a bus company has been formed. For the purpose of further expansion and to arouse the interest of the public to invest in municipal reconstruction, it is proposed that the Shanghai Transit Company be incorporated and its shares open to sale to the public.

2. The capital of the Company shall be G.Y.\$10,000,000 divided into 1,000,000 shares of G.Y.\$10 each.

3. At the formal incorporation of the Company, the Shanghai Municipal Government shall invest G.Y.\$5,000,000 for 500,000 shares. The other 500,000 shares will be sold to the public through the City Bank and/or other authorized banks.

4. The present assets of the Planning Board, including equipments and materials is worth over G.Y.\$8,290,000 whereas the liabilities of the Planning Board amounts to G.Y.\$250,000, leaving the net worth of the Planning Board to be G.Y.\$8,040,000 or a round figure of G.Y.\$8,000,000. The property now belongs to the Municipal Government and will be sold to the new Company. Estimates of the property together with detail inventories will be printed and may be read by future subscribers through underwriting banks in order to show its authenticity. After the sale of the 500,000 shares, the Planning Board can receive G.Y.\$5,000,000, 3 million of which will be returned to the Municipal Treasury and the remaining two million can be used for expansion and improvement purposes of the new Company.

5. To give protection and guarantee to the Company, the Municipal Government shall grant it monopoly of services with a franchise signed by both parties.

6. The organization of the Company and the issuance of shares will be made according to the relevant laws. The following are draft measures:

(1) The Mayor, the Secretary General, and the Commissioner of Public Utilities of the Shanghai Municipal Government, the Chairman of the City Council, the Chairman of the Chamber of Commerce, and the Chairman of the Bank's Association, etc. shall be sponsors of the Company responsible for writing down the regulations of the Company and the regulations of the issuance of shares.

(2) With the exception of the Mayor, the Secretary General, and the Commissioner of Public Utilities who are representatives of the Municipal Government, all the other sponsors will be requested to purchase one share each out of the 500,000 shares held by the Municipal Government. Those shares sold to the sponsors may be recalled by the Municipal Government at any time, if necessary.

(3) The sponsors shall, according to Article 133 of the Company Law, apply for registration to the Ministry of Industry and Commerce.

(4) After the receipt of the Ministry's official approval the City Bank and other banks shall openly advertise for subscribers.

(5) After the full amount has been collected, an inauguration meeting shall be conducted and according to the regulations of the Company election of directors and supervisors shall be made.

(6) The Municipal Government shall by virtue of its possession of 500,000 shares appoint half of the total number of directors and supervisors while the other half shall be elected from the other shareholders.

(7) The evaluation of the properties of the existing bus service under the auspices of the Planning Board has to be made by a joint committee consisting of representatives of the City Council, the Auditing Department, the Municipal Government, the Bureau of Public Utilities, and the Accountants' Association together with 4 other technical experts.

Attached: Brief estimate:

Item	Estimated Worth (in gold yuan)	Percentage	Remarks
Land	519,640.00	6.26%	
Buildings	981,846.60	11.83%	
Bus and equipment	4,982,135.66	60.03%	
Shop equipment	89,283.84	1.08%	
Tools	27,127.75	0.33%	
Furniture and miscellaneous	189,806.17	2.29%	
Materials	1,223,562.24	14.74%	
Fuel	286,161.07	3.44%	
Total	8,299,563.33	100.00%	

As the Transit Co. has only been passed in principal, the drafted franchise is withheld from publication.

2. "PREVENTIVE MAINTENANCE" SYSTEM OF BUSES

Between twenty to thirty buses are lying idle in the repair shops of the Shanghai City Bus Company awaiting replacements for worn-out gears and other vital parts, Commissioner T. C. Tsao of the Public Utilities Bureau told the "North-China Daily News" yesterday.

This is one of the causes of the overcrowding on the city buses on every route, he pointed out. An improvement is expected within three weeks' time.

Commissioner Tsao revealed that there was a temporary shortage of gears and other vital parts to replace those which have worn out. The bus company has ordered about five dozen gears from the United States but the shipping strike there has delayed delivery.

In the meantime efforts are being made to cast and manufacture the gears locally. These are expected to be ready within the next three weeks and to enable the idle buses to be put back into service.

The Commissioner told the "N.C.D.N." reporter of the "preventive maintenance" system at present in use by the Shanghai City Bus Company.

When a bus has run for 2,400 kilometres it is subjected to an inspection which includes, among other minor jobs, checking of lubrication, tightening of screws and changing of anti-freeze solution (in winter). At 12,000 kilometres there are replacements of minor parts, with special attention paid to clutch facings and brake linings. At 36,000 kilometres engines are checked and piston rings changed. At 72,000 kilometres the bus undergoes a general overhaul at the repair shops where repairs of wooden or aluminium bodies are carried out, cylinders re-bored and the chassis inspected for any signs of strain.

Doubled Life

This system, Commissioner Tsao pointed out, has been found to double the life of the city company's Dodge-built buses.

He added that ten out of the 300 buses in Shanghai have been scrapped for spare parts to be "cannibalized" by those in operation on the road.

Commissioner Tsao also revealed that "plus-gas" is being used by the local buses. This is a crystallized chemical compound, composed of hydrogen carbons which, when put in the

intake mixer, enables the bus engine to idle at red-light stops at a speed of 300 r.p.m. instead of the usual 600 r.p.m.

Petrol Saving

The use of "plus-gas," in the buses, he revealed, has resulted in a saving in petrol of from 10 to 15 per cent by the Shanghai City Bus Company.

The Commissioner said that the city authorities was hoping to introduce "plus-gas," which has been imported from England, to small cars here. It is now being produced locally by the Central Chemical Works, under the auspices of the National Resources Commission, who expect to turn out 100 kilograms of this chemical compound per month.

"It costs about 20 to 30 per cent the price of gasoline," Commissioner Tsao said, "and by its use we are saving some foreign exchange too."

(North China Daily News, November 12, 1948)

3. TRAFFIC LIGHT IMPROVEMENTS AND SAFETY FIRST WEEK

During prewar days when traffic conditions in Shanghai were fairly normal, there were only a limited number of traffic lights, installed by the ex-International Settlement, the ex-French Concession, and the Municipal Government. The 3 separate political units were responsible for the maintenance and improvement and additional installation of traffic lights in their individual administrative areas. Since the renditon of the Settlement and the Concession after V.J. Day, the Bureau of Public Utilities assumes sole charge of the traffic lights of Shanghai. Two guiding principles of the Bureau's work regarding traffic lights are, first, to increase the quantity of traffic lights and, second, to improve their quality.

(1) Quantity: The local population increased from three million at the time of the "take-over" to five and half million now and the number of vehicles increased from 151,998 to 332,734. The consequence is that traffic becomes extremely congested, making it much more difficult for the police to direct. To improve traffic conditions and to alleviate congestion, the Bureau has installed, up to the end of August 1948, 50 new sets of traffic lights.

(2) Quality: The traffic lights formerly installed in Shanghai have only two lights, red light and green light, operated by man. Dimensions of the covering glasses were respectively 6 inches, 8 inches, and 10 inches. After careful studies of the Bureau, it is decided that all the new traffic lights shall have 8-inch covering glasses and the lights with 6-inch and 10-inch covering glasses shall be gradually abolished. There are in addition two new equipments which are briefly described as follows:

4. Automatic synchronized traffic light: The Bureau has purchased from abroad a set of automatic synchronized traffic lights with red, green and yellow lights, which were delivered in summer of this year. They are originally intended to be installed along Nanking Road (Eastern) and Chung Cheng Road (Eastern). But due to the wide diversity in traffic density and the considerable difference in the distances between street crossings within the Nanking Road (Eastern) district, the lights originally intended for installation there were installed in Nanking Road (Western). Work here is divided in two stages. The first stage installation is made at the section from Tihwa Road (Northern) to Shensi Road (Northern) and proves to be quite effective. Vehicles passing through that section within the city speed limit can pass

without being stopped by red lights if they see a green light at the beginning of the section. In the second stage, installation of the automatic lights will be made for a section of Nanking Road (Western) from Chung Cheng Road (Northern 2) Whangpoo Road (Northern). As mentioned before the automatic lights compose of three lights, red, green and yellow. All are familiar with the meaning of the red and green lights. A little explanation may be necessary for the yellow lights. When vehicles or pedestrians have, before seeing the yellow light, already passed the white lines marked at the street intersections, they should proceed quickly through the intersection. When before crossing the white lines the vehicles or pedestrians see a yellow light on, they must stop immediately. For the set of automatic traffic lights installed in Nanking Road (Western), a cycle takes 40 seconds, with 20-second interval for the green light, 5-second interval for the yellow light and 15-second interval for the red light, there being no yellow light when the traffic light changes from red to green.

B. Electric Bells: Electric bells were installed at fifteen important street crossings to facilitate the direction of traffic. Vehicles and pedestrians passing through the intersections can not fail to hear the sound of electric bells which announce shifts of the traffic lights. The installation of the electric bells produces very good results and when the Municipal Treasury permits, more electric bells will be installed.

Statistics Showing The Installation of Traffic Lights

District	1945	1946	1947	1948
Whangpoo North . . .	61	79	87	91
Whangpoo South . . .	49	49	52	51
Wu Pai	—	1	9	9
Wu Nan	—	5	5	7
Municipal Center . . .	—	—	—	1
 Total	 110	 134	 153	 160
 Percentage of Increase over 1945	 0	 21.7	 39.1	 45.5

Remarks: There are now 19 sets of automatic traffic lights in the Northern Whangpoo Districts.

4. THE PORT OF SHANGHAI AND ITS FERRIES

T. C. Tsao

The role of modern ferries, that might be called upon to perform in the economic operation of the port, in alleviating street and river traffic congestion and in setting up a pattern for the future development of the metropolis, is often overlooked and underestimated.

They are treated as a shipping concern by many; and considered obsolete, inadequate and mediocre as a means for public transportation across the Whangpoo by others. It is true that a ferry service of low standard, efficiency and traffic capacity has little economic value and therefore no place in the transportation of tomorrow. It is also true that the existing municipal ferries are far from being adequate and modern. Nevertheless, reasonable standard, efficiency and traffic capacity can be achieved through sound engineering planning and sensible management, especially terminal traffic planning and management, and existing backwardness of them should not be construed as a death sentence for their future possibilities, if proper efforts be directed for their improvements. Modern ferries are performing splendid services in various metropolises and more ferries, of modern design and construction, are being built for the future abroad.

The Bureau of Public Utilities, since starting functioning in September 1945, has considered the port's intra public transportation problem from an over-all standpoint and on a city-wide basis. The ultimate transit system in Shanghai shall be a composite whole consisting of surface lines—motor buses, trolleys and trams—on the land and ferries across the river. The ferries, both passenger and vehicular, will be constructed at twenty crossings spaced at 2 kms. on the average and they shall serve as links between surface transit lines on both sides of the river, so that the flow of passengers and vehicles may be continuous and not interrupted by the gap of water. Such an arrangement, when successfully carried out, will avoid traffic bottlenecks and should afford much convenience to the public in crossing the river.

Past Works

During the first two years of the administration, it is gratifying to say that the war battered ferry facilities have been largely rebuilt or repaired, making possible the five ferry services now in operation for passengers. In the meantime, the administration

also feels fortunate in overcoming odds and difficulties to put the first vehicular ferry of the port, located at Lohkapang Road, Nantao, to serve the public.

An average of 50,000 people and 100 trucks and other vehicles are being served daily at present.

Passenger and Vehicular Projects

It should be admitted that the existing municipal ferries are low in standard, meagre in facilities and cramped in space. However, plans have been worked out for: 1. a modern passenger ferry ('Downtown') service between the Bund in Shanghai and Pootung Point across the river; 2. Vehicular and passenger service between Lay Road in Shanghai and Holt's Wharf in Pootung.

The 'Downtown' shuttle service for passengers will ultimately have one elaborate terminal at each end incorporating a bus and vehicle terminal, a concourse, shops, public utilities, radar, radio telephones and other features, constituting the last word in commuting service. This shuttle service, when materialized, will assure and expedite community development in Pootung besides saving thousands of people their countless hours wasted daily in commuting between homes and offices.

At Lay Road, shuttle service for passengers and vehicles will be provided side by side ultimately. The plan provides for passengers terminal facilities and bus and vehicle plazas for the service of passengers. The through vehicular traffic, which is planned to be segregated, in the terminal areas, from local traffic, passenger or vehicular, will be an important move to rationalize the cargo movement of the port and thereby to rejuvenate the stifled wharves in Pootung from their present plight.

In both projects, water and street transportation will be closely linked; terminal traffic has received utmost attention; and the schemes, comprehensive as they are, will permit progressive development to suit traffic demand as well as financial resources.

5. THE NANTAO VEHICULAR FERRY SERVICE SLOWLY BUILDING UP

Facilities for cross-river vehicular traffic in this port was not available until October 10, 1947 when the Nantao Vehicular Ferry linking Nanmatao in Pootung and Lohkapang Road in Shanghai was successfully tried out and about one month later, opened to traffic. It is opportune here to point out, that this vehicular service although much below expectations in vehicular traffic thus far due largely to the lack of roads in Pootung, has already demonstrated its pioneering influence in port development, as displayed by the growing number of significant industrial installations and site procurements and the general appreciation of land values there.

The location, which encountered protracted difficulties, was the only possible alternative and was decided upon after long and serious considerations. The balance sheet of advantages and disadvantage are the following. On the advantages side. 1. absence of expensive or permanent structures and presence of cheap trades using the sites; 2. straight stretch of river channel; 3. fairly direct 1,600' crossing; 4. important wharf properties in the terminal vicinity at Pootung; 5. Proximity of Pootung terminal to the Pootung Highway and the comparative simplicity in the building of the approach road; 6. important roads—the Lohkapang Road to Sicawei and the Wai-ma-lu to "downtown" —leading to the Shanghai terminal. On the negative side: 1. shore space at either end being too cramped to permit a good vehicle plaza; 2. "End-on" berthing, the most efficient arrangement, being impossible at the sites; 3. space between the normal lines and the shore line being too cramped to permit liberal construction.

Under a set of rare and exacting conditions, unique engineering, peculiar to this particular project, was worked out. The vehicle, in crossing the river bunding line, goes through a 90-degree curved R.C. trestle ramp to a 60-ft. steel-trussed floating ramp, then boards the car-float or ferry at its bow or stern and then lands at the jetty on the opposite shore through the other end of the ferry. The curved roadway has an outer radius of 40 ft., and a width of 12½ ft. and is super-elevated. The design loads, being 15 tons and 10 tons for the fixed and movable structures respectively, will ultimately permit 20-ton vehicles of 28-ft. length or less to pass with safety.

The floating ramp is supported at one end on seats over R.C. piers and at near the other end by the hollow legs of an U-

shaped pontoon, whose main body is submerged. This enables the floating ramp to rise and fall with the tide ranging 8 feet daily, while hoisting device is provided by an over-head frame and a small handwinch to adjust the floating end of the ramp which should rest securely on the seat at either end of the car-float for moving traffic.

For expediency, two converted LCTs each carrying 8 trucks or 14 cars are being used. Their berthing and mooring along-shore is facilitated by 60' x 5' x 5' mooring pontoon, secured in position by dolphin piles at its ends and shore-side.

Underlying principles in the planning of this project are:
1. economy in construction and operation; 2. simplicity, safety and speediness in berthing; 3. speediness in embarkation and disembarkation of vehicles; 4. orderliness and efficiency of traffic in terminal areas and adjacent streets. Traffic signs and signals, night illumination, filling stations, and various utilities as called for in the original plans will not be executed probably until a later date together with important structural improvements now in abeyance. Naturally the efficiency, service and standard are not what was expected ultimately. The wharves and godowns in the Pootung vicinity due to inaccessibility of roads failed to provide any traffic which is disappointing. Experience in operation also proved that "along-side" berthing is least desirable for the local ferries.

6. THE YANGTSZEPOO VEHICULAR & PASSENGER FERRY PROJECTS

Summary of Report

B. H. Louison

Civil Engineer & Architect

August, 1948.

It is stipulated in the Franchise Agreement between the Shanghai Municipal Government and the Shanghai City Ferry Co. that the latter shall undertake the construct a vehicular ferry at Lay Road in 1947 and a passenger ferry at Ming Seng Road in 1948. In pursuant of this stipulation the writer is privileged to make a first hand study of the feasibility and advisability from the economic, traffic and engineering angles.

These proposed services, having their locations identical—between Lay Road in Shanghai and Ming Seng Road (Holt's Wharf) in Pootung—must be treated together in the entirety.

The Project, when materialized, will provide a transportation link across the Whangpoo of unsurpassed importance; will rejuvenate the wharves and godowns in Pootung, whose enormous investments of over 100 million dollars (U.S.) are now at stake, due to lack of cross-river transportation, to their proper place, utility, and value in port operation; will set the pattern for the port's future growth and decentralization and give impetus to expedite the development of Pootung; and will appreciably improve the down-town street traffic.

As an investment, the project is self-liquidating and will give steady and attractive returns comparable to that of any utility.

The sites offer unusual opportunity for construction of small-scale but modern and efficient ferry services, using 'double-headers' and closely linked with bus services at both ends.

The vehicular service which is an urgent demand by wharf and godown owners and shipping companies will form the first stage of the development, taking about 9 months. The facilities for passenger service including the boat, the terminals and vehicle plazas will form the second stage of the development, and will take a year. The progressive investment should facilitate financing.

For the first few years of operation, one car-float and one double-deck passenger boat will probably suffice and on this basis, the net return on capital investment will be:

Vehicular traffic	8.11%
Passenger traffic	12.28%

Ultimately, 3 car-floats and 3 passenger boats can be operated with a capacity of 1,500 10-ton trucks in a day of 14 hrs. and 120,000 people in an 18-hr. day, thus the working profit will be greatly augmented.

The capital expenditure has been estimated as follows:

1st stage—Vehicular Ferry

Lay Road Landing	G.Y.\$380,000.—
Ming Seng Road Landing	187,500.—
1 Car-float (double-header)	
110'-0" L. x 30' x 7'-0" D.	
Working Capital	80,000.—
<hr/>	
Total	G.Y.\$967,500.—

2nd stage—Passenger Ferry

Lay Road terminal	G.Y.\$1,315,000.—
Ming Seng Road Terminal	1,085,000.—
1 Ferry boat-450 passengers (2-decks & "double-reader")	300,000.—
Working Capital	200,000.—
<hr/>	
Total	G.Y.\$2,900,000.—

7. FRANCHISE OF CITY FERRY COMPANY

THIS AGREEMENT is made and entered into at Shanghai, China, this day of 194.... by and between the Shanghai Municipal Government (hereinafter designated as the "Municipal Government") of one part and the City Ferry Company, Limited (hereinafter designated as the "Company") of the other part WHEREAS to balance the development of the two banks of the Whangpoo River the Municipal Government sponsors the organization of the City Ferry Company, Limited, and Whereas the Company is granted sole rights by the Municipal Government to operate ferry service within the Municipality of Shanghai.

NOW, THEREFORE, for and in consideration of the mutual covenants and agreements on the part of the parties hereto to be kept and performed as hereinafter set forth, IT IS HEREBY AGREED AS FOLLOWS:

SECTION I FRANCHISE AREA:—All districts under the jurisdiction of the Municipal Government.

SECTION II INVESTMENT OF THE MUNICIPAL GOVERNMENT:—The ferry boats, wharves, equipments and installations, etc. of the former Municipal Ferry Service shall after proper evaluation be considered as the investment of the Municipal Government in the Company.

SECTION III OPERATION RIGHTS:—The Municipal Government grants sole rights to the Company to operate ferry services on the waterways within the Municipality to carry passengers with or without hand baggages and vehicles with or without cargoes loaded. This Agreement shall be effective for a term of Thirty (30) Years from and after the final date of the signing of this Agreement by the Municipal Government and the Company. The Municipal Government agrees not to grant the right herein stated to any third party, which however, shall not be considered to include the following:—

- A. Lighterage and handling of cargoes on the waterways of the Municipality.
- B. Ferries operated by individuals, bodies or plants for their private uses. Also ferries not on regular operation for the carrying of passengers and or vehicles for the public.
- C. Timber man—powered ferry boats or yachts, without definite and fixed operation lines.

- D. Routes which the Company is at present unable to immediately establish and which the Municipal Government may therefore permit, for period or successive periods each of less than one year in duration the setting up of other temporary ferry services. In the event that the Company wishes to operate any of the aforesaid routes, it shall apply to the Municipal Government before the expiration of the term granted to the respective temporary service and shall inaugurate services immediately upon the suspension of operation of the concerned temporary service.
- E. Other long distance ferries from nearby cities terminating within the Municipality or from the Municipality to the nearby cities with not more than one stop within the Municipality.

SECTION IV OPERATION ROUTES:—

- A. The Municipal Government grants permission to the Company to first resume operations on the following routes operated by the former Municipal Ferry Service:

1. Peking Road Bund to Woosung via Situ, Chinning-tse, Tungkou, Kaochiao, etc.
2. Tungmen Road to Tungchong Road.
3. Tungkadoo to Tangchiao (shall be equipped for the carrying of passenger cars.)
4. Chinwangtao Road to Chichongsang.
5. Tinghaichiao to Chinningtse.

Services on the above lines shall be resumed within six months of the date of the signing of the Agreement.

- B. The Company shall at the time of the signing of this Agreement submit a preliminary five-year plan which when approved by the Municipal Government shall be carried out in stages. The Company shall place initial emphasis on the planning and inauguration of service on one passenger line and one truck ferry line, which shall be open to public use within one year and two years respectively after having acquired the right to the use of the necessary wharf, shore line and land, all to be with the cooperation of the Municipal Government.

- C. In the interest of the public, the Municipal Government may negotiate with the Company to alter or add to the existing lines and to increase the number of ferry boats.

Unless for special and valid reasons the Company may not refuse to make such alterations and/or additions. In the event that the Company should desire alterations or addition to the routes for business or operation reasons, it shall apply to the Municipal Government for approval.

D. The Company shall not raise any objection when the Municipal Government shall in future construct a tunnal or bridge to span the Whangpoo River.

SECTION V SERVICE.—During the effective term this Agreement the Company shall maintain a service of high efficiency with adequate and up-to-date equipments to the satisfaction of the public.

The schedules of the various lines shall be submitted to competent authorities under the Municipal Government for approval. When the operation of the Company shall have improved in the future, the Municipal Government may instruct the Company to further lift the standard of service which the Company shall not refuse to comply without valid reasons.

SECTION VI EQUIPMENTS:—The Company's ferry boats, wharves and other equipments shall, in accordance with the instruction of the Municipal Government, but with due consideration of the Company's financial conditions, be up-to-date, aiming at convenience, safety and good appearance to meet the requirements of the City. The Municipal Government besides having the right of supervising and approving such equipments, shall also have the right to instruct the Company to improve any item of equipment which the Municipal Government may deem as sub-standard and to order the suspension of the use of any item of equipment which the Municipal Government may consider as hazardous to public safety. All ferry boats in the operation of the Company shall be examined and approved by competent marine authorities before being permitted for use in the service.

Of the Company's wharf facilities, the part representing the investment by the Municipal Government shall be taken over by the Company; the part leased to the Company by the Municipal Government shall be entrusted to the Company's care and maintenance for which the Company shall pay regular rentals; and the part for public use may be used by the Company in accordance with the regulations of the Municipal Government. If the Company wishes to make any alteration or addition to the invested and leased portion of the wharf facilities, the Company shall first apply to the Municipal Government for approval.

SECTION VII USE OF SHORE LINES:—When the Company requires the use of shorelines and land for the purpose of constructing ferry stations or for other operational purposes, and

when such applications by the Company should meet the approval of the Municipal Government, the following procedure shall be observed:

- (1) When the ownership of such properties are in private hands the Company may with the assistance of the Municipal Government requisition such properties at fair and reasonable prices.
- (2) If owned by the Municipal Government, the Company may apply for lease of the property from the Municipal Government and at the time of the returning of the land, the Municipal Government shall pay to the Company a sum representing the fair price, (the then market price less depreciation) the land of whatever constructions the Company may have erected on the property.
- (3) If owned by Central Government bodies, the Company shall apply to the Municipal Government to negotiate for the right of the use of such properties with a lease through the Municipal Government. However if the Company should be able to secure a lease directly, the Company is at liberty to do so.

SECTION VIII PROCEEDINGS OF CONSTRUCTION WORK:—The Company shall have the right to build modern ferry stations and other structures but it shall, in all events comply with the regulations of the Municipal Government and other competent authorities, in the applications for permits and the payment of fees before starting the construction work.

SECTION IX BUNDING:—

- A. When during the Company's construction of its ferry stations, any disturbing to the city's bunding work should become unavoidable, the Company shall before proceeding with the construction, seek the approval of the competent Municipal authority and after completion of the construction shall restore the bunding work to its original capacity and safety.
- B. If due to the construction of the Company's ferry station, the original condition of the bunding can not be restored, the Company shall before proceeding with the construction obtain the approval of the competent municipal authorities.
- C. In case there is no suitable bunding at the site of the proposed ferry station, the Company may with the approval of the competent authority build bunding work at the site.

SECTION XI MARINE PERSONNEL:—All marine personnel in the employ of the Company shall be qualified persons registered with and approved by competent marine authorities. The Municipal Government may order the Company to suspend the service of unqualified persons.

SECTION XII FARES:—All fares fixed by the Company shall be approved by the Municipal Government and shall be advertised in local newspapers for three consecutive days before enforcement of same. In case of need for revision of tariffs, any suggestion by either the Municipal Government or the Company shall be carefully considered by the other party. The fixing of the fares shall take due consideration of all items of operational expenses, depreciation, legitimate profit, royalty, and legitimate sinking fund. Reasonable maintenance and improvement expenditures may also be included. The Company shall, however, seek other means of financing large scale expansion projects. In case of great fluctuations of commodity prices and or fluctuations in the purchasing power of the legal tender, the Company may apply, with estimates of the receipts and expenditures, to the Municipal Government for such revision of fares as would be necessary to maintain the legitimate profits of the Company, in the event of such occurrences. The Municipal Government shall within thirty days after receiving such application approve and fix a reasonable schedule of fares to maintain the Company's legitimate profit. If the Municipal Government should fail to approve and fix a reasonable schedule of fares within thirty days after receiving the Company's application, the Company may then be free to introduce the schedule of fares as stated in the Company's application to the Municipal Government.

If the profits as realized by the Company is in the opinion of the Municipal Government in excess of the legitimate profits, the Municipal Government may instruct the Company to reduce the scale of fares.

SECTION XIII ROYALTY:—The Company agrees to pay to the Municipal Government royalty by month, amounting to five percent of the gross revenue of the Company.

SECTION XIV OPERATION REPORTS The Company shall prepare and submit to the Municipal Government monthly reports of the Company's revenue, reports covering actual revenues and expenditures of the Company in every three months, and at the end of each year, annual business reports, duly audited by certified accountants. The Municipal Government shall have the right to send from time to time, authorized agent to examine all books relevant to the Company's operation.

SECTION XV GUARANTEE The Company agrees to indemnify the Municipal Government against all claims arising out of the Company's ferry operation, for which the Company will be fully responsible. However in cases where the fault does not rest with the Company, the Municipal Government shall give supporting evidences for the Company wherever possible.

SECTION XVII CANCELLATION In case the operation of the Company should constitute a violation of any of the provision of this Agreement the Municipal Government may notify the Company to make rectifications within a reasonable period of time, failing which the Municipal Government shall have the right to cancel this Agreement by means of a written notice which shall become effective in six months. Under such circumstances, the Municipal Government shall still reserve the right to demand for compensation for any losses suffered due to the violation of Agreement terms by the Company. The Company's properties and assets shall be valued in accordance with the provision of Section XIX and surrendered to the Municipal Government which shall make cash payments for same.

SECTION XVIII TERMINATION AND EXTENSION In the event that neither the Municipal Government nor the Company shall have any intention of extending this Agreement, it shall serve written notice to the other party to this effect one year in advance of the expiration date of this Agreement, the twenty-sixth of March of the year Nineteen hundred and seventy-seven, under which circumstances the Company's properties shall be valued in accordance with the provisions of Section XIX and paid for in cash by the Municipal Government.

In the event that at the end of the term of this Agreement, there is no objection from either party, this Agreement shall be automatically extended for a period of ten years. Henceforth this same procedure shall govern at the end of every successive period of ten years.

SECTION XIX VALUATION At the termination or cancellation of this Franchise, the valuation of the Company's properties and assets shall be made on the basis of the then market value less depreciation. For the conducting of valuation process, each party shall appoint three experts. In the even that the two groups of experts should fail to reach an agreement the matter shall be referred to arbitration as provided for in Section XX.

SECTION XX ARBITRATION In case of doubt in the interpretation of this Agreement or other disputes which cannot be settled by mutual agreement between the two parties, each party shall appoint one arbitrator for arbitration. If the two arbitra-

tors should still fail to agree, the Chairman of the Shanghai Chamber of Commerce shall be the final umpire.

SECTION XXI TAKING EFFECT This Agreement shall take effect on the date of the signing of this Agreement.

This Agreement shall have two original copies. The Municipal Government and the Company shall each have in custody one original copy. In addition there shall be five duplicate copies to be deposited with the Bureau of Public Utilities, the Bureau of Public Works, the Bureau of Land affairs, the City Trust, and the Witness.

*Attached: A copy of the Five Year Plan of the City Ferry Company.

Representative of Shanghai Municipal Government
Commissioner of Public Utilities

Representative of the City Ferry Company
Authorized representative

Witness

(Signed)

March 26, 1947.

*As the 5-year plan is subject to modification, it is deleted here.

8. STATISTICS OF TRANSIT FACILITIES

January, 1946—September, 1948

TIME	Number of routes				Number of cars				Number of Passengers			
	Total	Tram	Trolley	Bus	Total	Tram	Trolley	Bus	Total	Tram	Trolley	Bus
January, 1946	22	11	8	3	420	285	96	39	18,513,049	12,795,349	4,395,549	1,322,451
February	22	11	8	3	420	285	94	41	20,665,108	13,379,205	5,483,329	1,802,474
March	24	12	8	4	425	279	89	57	15,576,994	15,684,981	6,223,791	2,668,222
April	24	12	8	4	416	279	82	55	27,007,652	17,975,420	6,270,303	2,761,929
May	24	12	8	4	429	275	94	60	22,041,369	14,547,972	5,339,597	2,153,808
June	24	12	8	4	419	271	91	57	24,822,285	16,461,323	5,975,387	2,385,575
July	25	12	8	6	423	261	83	79	25,990,947	16,782,979	5,938,849	3,269,119
August	26	12	8	6	421	265	78	78	28,201,257	16,233,637	6,146,949	3,820,671
September	28	13	8	7	445	267	73	105	28,371,036	17,279,230	5,942,915	5,130,891
October	30	13	9	8	504	277	107	129	31,607,376	17,889,312	7,534,242	6,203,822
November	32	13	9	10	524	275	111	138	30,143,157	17,114,928	7,499,508	5,829,721
December	33	13	9	11	551	282	112	157	27,834,210	15,180,222	6,550,432	6,163,156
January, 1947	33	13	9	11	559	288	111	160	26,977,037	14,087,456	6,314,461	6,575,120
February	33	13	9	11	553	284	108	161	27,618,332	14,253,658	6,500,650	6,863,824
March	33	13	9	11	598	288	116	194	33,256,651	17,048,320	7,668,436	8,539,894
April	33	13	9	11	591	282	112	197	35,048,771	17,536,859	7,928,569	9,583,343
May	34	13	9	12	606	284	117	205	37,148,097	18,142,077	8,395,872	10,610,448
June	34	13	9	12	618	285	119	214	34,369,882	16,893,478	7,576,391	9,930,013
July	34	13	9	12	615	280	120	215	27,014,316	14,262,556	5,561,012	7,190,748
August	36	13	9	14	660	284	124	242	26,461,980	13,822,678	5,184,246	7,455,056
September	36	13	9	14	666	284	124	261	28,065,099	13,834,888	5,404,507	8,824,704
October	36	13	9	14	658	287	125	246	29,635,381	14,667,305	5,931,692	9,036,384
November	36	13	9	14	663	288	127	248	26,182,104	13,854,220	5,388,339	6,939,545
December	36	13	9	14	665	288	124	253	28,303,708	14,220,504	6,017,063	8,066,144
January, 1948	38	13	9	16	691	290	126	275	28,066,688	13,830,606	5,761,180	8,474,932
February	37	13	9	15	701	295	127	279	25,873,546	12,643,076	4,987,480	8,242,690
March	40	13	9	18	714	291	126	297	29,305,363	15,109,057	5,473,562	8,722,744
April	40	13	9	18	699	291	125	283	27,332,152	11,354,312	5,069,329	7,908,511
May	42	13	10	19	718	291	126	301	26,365,805	14,024,321	4,952,845	7,388,639
June	41	13	10	18	717	293	131	293	26,650,713	13,814,560	5,241,025	7,595,428
July	41	13	10	18	682	293	123	266	24,614,842	12,997,956	4,889,164	6,727,722
August	41	13	10	19	653	291	120	242	18,437,488	10,094,430	3,563,745	4,779,613
September	41	13	10	18	654	296	128	246	27,463,618	13,339,372	6,054,694	8,069,592

PART VI WHARVES, GODOWNS, AND PORT AUTHORITIES

1. THE PORT OF SHANGHAI

At the Rotary Club luncheon yesterday, Mr. T. C. Tsao, Commissioner of Public Utilities of the Shanghai Municipal Government, discussed the present and future possibilities in the development and rehabilitation of Shanghai as a port for ocean shipping. Mr. Tsao spoke as follows:—

In 1935 Shanghai ranked tenth among world ports and third among Asiatic ports, in the size and tonnage of shipping handled. The quantity of net registered tonnage, entered and cleared then was more than 35,000,000 tons, or over 50 percent of those of the whole nation.

The position of Shanghai in China as the great Yangtze entrance port is remarkably privileged. It is located close to one of the largest navigable rivers in the world at a point in the estuary as near to the sea as the natural conditions permit a deep draft port to be placed. The watershed of that river, the Yangtze, has an area of some 750,000 sq. statute miles or about half of China proper. Owing to natural barriers, nearly all this area is and will remain to be the hinterland of this estuary port.

Approach from the open sea to the Yangtze River crosses the Yangtze Bar, known as "Fairy Flats," a silt deposition 20 miles long and extending from the open sea to the south channel of the Yangtze River. After crossing the bar, the course to the port of Shanghai lies up the Yangtze River for 50 miles to the mouth of the Whangpoo River.

In 1937, the channel across the Yangtze Bar was 21 ft. and that of the Whangpoo River was not less than 26 ft. at the lowest low water. In 1943, the crest of the bar might be only 18 ft.

The tide over the bars ranges from 16 ft of "spring rise" to as little as 8 ft. at "neaps," being much affected by the flood stage of the Yangtze River and wind.

By riding high tides, vessels drawing up to 30 ft. had no difficulty in entering or leaving the port.

Technically, Shanghai is a "River Port," where the Whangpoo River forms the harbor and its traditional riparian wharf developments provide the berthing for ships.

The harbor consists of the channel of the Whangpoo River from the Chang Chia Tang Creek to the mouth, a length of 128,000 ft., with 8 main bends.

Waterways Maintenance and Improvement

For the sustained prosperity of the port of Shanghai, the maintenance and improvement of the waterway is vital. Unless this is properly and promptly executed, other improvements will be of no value.

There is no difficulty for ships drawing up to 30 ft. to cross the Yangtze bar at ordinary high tide. This is sufficient for all but a few ocean going ships and these few are not now calling at the Chinese coast ports. Therefore the dredging of the Whangpoo to restore the navigable channel to 26 ft. at lowest low water and up to 32 ft. adjacent to certain wharves and in part of the anchorages should be the first task of port rehabilitation. This would always accommodate most of the ships using the port and for those drawing between 24 ft. and 30 ft., it would only be necessary to ride the high tides for arrivals and departures.

The reach of channel to be dredged is approximately 14,000 ft. long and it has been estimated that 1,000,000 c.yds. of material must be removed to give the channel a 26 ft. depth at lowest low water and a bottom width of 400 ft.

The next stage would be to extend the dredging to provide a full channel depth of 30 ft. at lowest low water.

Second Rank Port

Modern liners in trans-Atlantic service drawing 40 ft. are not uncommon, and this draft may be further increased in the future. That this port will not be able to accommodate such ships for many years to come is a certainty. Unless drastic steps can be taken for its development and modernization, Shanghai will probably remain a second rank port.

Harbor Pollution

A word may be mentioned about harbor pollution. A very critical and menacing situation has been created by the free dumping of refuse and garbage into the Whangpoo which is the source of our drinking water. Even though purification process is being done at various plants, there is no justification for the continuance of the practice which will certainly intensify the pollution. Pre-war Hamburg prohibited the use of toilet in ships while in the harbor. In Shanghai this problem has been so far very much overlooked. Appropriate steps must be taken to ameliorate the situation.

Mechanical Equipment

Mechanical Equipment for Wharves and Bunkering and Water-supply Facilities for ships—To speed up the handling of

cargo and thus decrease the berthing time of ships, mechanical cargo handling equipment such as grain elevators, coal loading and unloading equipments, should be installed for the handling of cargoes, which has been largely relying on man labor thus far. This will not only lower cargo handling costs, but will be an inducement to foreign shipping and a contribution to general efficiency of the port.

Facilities of bunkering and water-supply for ships are, at present, either absent or inadequate and should be implemented.

Foreign Trade Zone

Example can be had of Pre-war Hamburg, where a district of free port was set aside, mainly, to stimulate trade and for the further processing of unfinished products, imported free of duty and intended for re-export. San Francisco has very recently created a "foreign trade zone" area. So in America, there are now three other ports are likely to follow, viz., New York, N. Orleans, San Francisco. In Shanghai, the same idea may be profitable in the future.

Rail Terminal For Harbor

In the port of Shanghai, rail to water connection was practically non-existing until recently. We need efficient and compact rail terminal or terminals to link up the principal wharves which, unfortunately being scattered over a lengthy river front make the provision of adequate and efficient rail connections difficult and prohibitive.

Such connections are essential for economical transshipment of cargo from water to rail or vice-versa, and form one of the reasons favoring the adoption of the "wet basin" or dug-in dock system to meet a part of the port's harbor requirements.

Cross River Communication

It is highly regrettable that, until very recently, there were no facilities for vehicular traffic across the Whangpoo River, that is so much needed to facilitate the movements of cargo between Pootung and Shanghai Proper. Transfer of cargo between the two banks of Whangpoo River by lighter and hand labor is a slow and expensive operation.

To rectify this abnormal condition in the quickest possible time and with the least expense, the City Government initiated last year a vehicular ferry service in Nantao. In the first 5-year plan, designed to cope with the problem of cross-river communication of Shanghai, another vehicular ferry service in Hongkew and a modern passenger ferry service at the Bund (Peking Road) are being projected.

Each vehicular ferry will have an ultimate carrying capacity of over 1,000 trucks and cars every day while the projected passenger ferry will ultimately carry 100,000 passengers daily.

With the materialization of these projects, coordinated by the improvement of roads, sewers and other utilities, we are sure that residential construction and industrial development will hasten their tempo in Pootung, the fate of which as well as the outlook of Shanghai will be totally changed. The Whangpoo River will thus be temporarily bridged until such a time as it may be spanned by a bridge or a tunnel. I am of the opinion that an adequate system of passenger and truck ferry service will suffice to meet the present cross-river communication requirement and that a tunnel or a bridge will be justified only when Pootung is more fully developed.

Port Administration

The control of the harbor at present is vested with the Harbor Master of the Customs while the Whangpoo Conservancy Board undertakes the dredging and channel improvement. Their power is very limited.

To give not only governmental agencies interested in port administration but also private interests using the port a fair representation on matters of port control, the Shanghai Port Affairs Commission has devoted no less than half a year in drafting the organic laws of the proposed Port Authority of Shanghai. The draft has now been submitted to the Executive Yuan for approval and must go to the Legislative Yuan for adoption with a consolidation act to establish the legal status of the Authority. This Authority will be vested with wide authority to administer, finance, and control the port of Shanghai. It will be composed of twenty-eight members representing relevant Government offices, civilian unions and associations. The proposed Authority, instead of being a bureaucratic organization, will be autonomous, self-supporting, self-developing and non-profit making public corporation.

Planning For The Future Port

Thus far, the Port of Shanghai has been developed in a laissez-faire manner and the necessity to base future development on further extensive and systematic planning is beyond question.

In our present discussion, we shall limit ourselves to certain principles governing the physical planning of the harbor and related facilities:

Trade And Shipping Prediction

The physical size which will be conceived for the future port naturally is vital and of primary importance. To provide for accommodation requirements of the future, a forecast of the

shipping and trade volumes is essential. In normal years, the growth has been somewhat following the geometrical progression with a rate of 5½ percent per annum, thus in 1978, or 30 years hence, the total shipping tonnage will probably reach the neighborhood of 150 million tons mark, assuming a complete recovery to 40 million tons by the end of 1953. The cargo tonnage which has been usually about 30 percent of shipping tonnage for Shanghai, will probably reach 45 million tons in 1978.

Equitable Utilization Of Water Front

Being fundamentally a river port Shanghai should devote a major portion of its water front to the riparian wharves for which the natural configuration is well adopted. This, however, must not preclude the co-existence of wet basin docks as formed in ports abroad under similar conditions.

The utilization of the Whangpoo River water front is now almost exclusively for shipping and industries. There is no justification for such. We advocate that parks, parkways, residential areas, yachting, public jetties, ferry landings, etc. should be given proper place and equitable utilization of the water front. For they contribute also greatly to the living, utility and happiness of the community.

(3) Reservation For Future Expansion

Within the present harbor, only the lower reach is still available for riparian development which will come first in consequence; while the middle reach is overcrowded. We believe ultimately that wet-basin harbor besides the riparian wharves will be necessary. Reservation for such sites is essential, economical, and beneficial to all concerned.

Four such sites have been suggested from time to time, viz: (1) at Woosung Creek, (2) below Jukong Wharf, (3) Point Island and (4) Pootung Point.

The Woosung Creek site was first adopted by the former Greater Shanghai City Government, and later accepted by the Japanese during the occupation period with modifications, but the site was objected to for certain reasons by the League of Nations' experts in 1938. Both sites (2) and (3) were Whangpoo Conservancy Board conceived schemes; while the (4) was proposed by the engineers of Siemens Co.

The various schemes need further details and authoritative study from various angles.

4. Summary

The following is a summary of suggested principles on which should be based the future planning for the Port of Shanghai:—

A. Under an independent and powerful Port Authority, the future requirements of shipping frontage should be estimated and checked against the available frontage, remembering that not all the frontage should be for shipping, but taking into consideration of other requirements such as parks, parkways, industries, public jetties, ferry landings, etc. The extent of reservation shall thus be established.

B. Provision for the growth of industries and trading in the vicinity of wharves should be of paramount importance.

C. The Whangpoo River should remain a "belt highway" for shipping and for the collection and distribution of cargo instead of the abuses now prevalent in the using of the waterway as a storage and anchorage to the obstruction of the river.

D. Safety during peace and war should not be overlooked. For instance the concentration of all oil tanks at a single area like Gongh Island is a dangerous practice at all times.

E. Conservancy and hydraulic studies of Yangtze Bar and harbor should receive greater importance. Designs should be made with guidance of experiments.

F. Rail connections and terminals with the wharves should be well coordinated, and city's road traffic near wharves should be given proper consideration.

G. Nationalized grouping of wharves for specific uses should be promoted.

In conclusion, I like to quote what President Roosevelt spoke wisely:—

"There are tasks ahead of us which we must now complete with the same will and skill and intelligence and devotion which have already led us so far on the road to victory."

2. NANTAO WHARVES TO BERTH 18 VESSELS

"The nine newly restored wharves in Nantao will provide berthing places for 18 vessels of 3,000 tons capacity," PUB Commissioner T. C. Tsao told a group of City Councillors and reporters who visited the new wharves yesterday afternoon. "The reconstruction work was completed in eleven months and cost the City Treasury over seven billion dollars," the Commissioner said.

The following is Commissioner Tsao's report: There were in pre-war days 21 floating wharves and 6 fixed wharves in Nantao, covering a waterfront of 5,300 meters from Tungmen Road at Tungkadoo. Together with the nearby godowns the wharves had served the need of local populace excellently. Many sea and inland vessels had berthed there, bringing much prosperity to Nantao. Unfortunately during the war the enemy had wrought heavy destruction to all the Nantao wharves, with the result that no vessels could berth there.

Since the take over the Bureau of Public Utilities had taken cognizance of the fact that the early restoration of the Nantao wharves was one of the most imperative programs for the rehabilitation of Shanghai. As the restoration work would involve huge expenditures and involve many technical difficulties, the Nantao Wharf Restoration Commission was formally established in January, 1947, members of which include the commissioners of Public Utilities, Public Works, and the Bureau of Land Administration, and representatives from the local Shipping Guild and the Bank of Communications, with the PUB Commissioner as the Chairman.

Restoration Scheme

After careful deliberations, the Commission decided on the following restoration scheme:—

1. The work is to follow the standards of the prewar wharves.
2. The work is to be divided into two stages, the first covering wharves Nos. 1 to 9, and the second stage covering wharves Nos. 10 to 18.
3. Dredging work shall be done to 14 feet below low tide level to accommodate vessels of 3,000 tons capacity.
4. Fuel Control Commission will be requested to supply fuel for the silt-dredging work. The dredging work will be done by the Whangpoo Conservancy Board.
5. The construction and fixing of wharves will be done by the Bureau of Public Works.

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PLAN OF

Pontoon Nos.

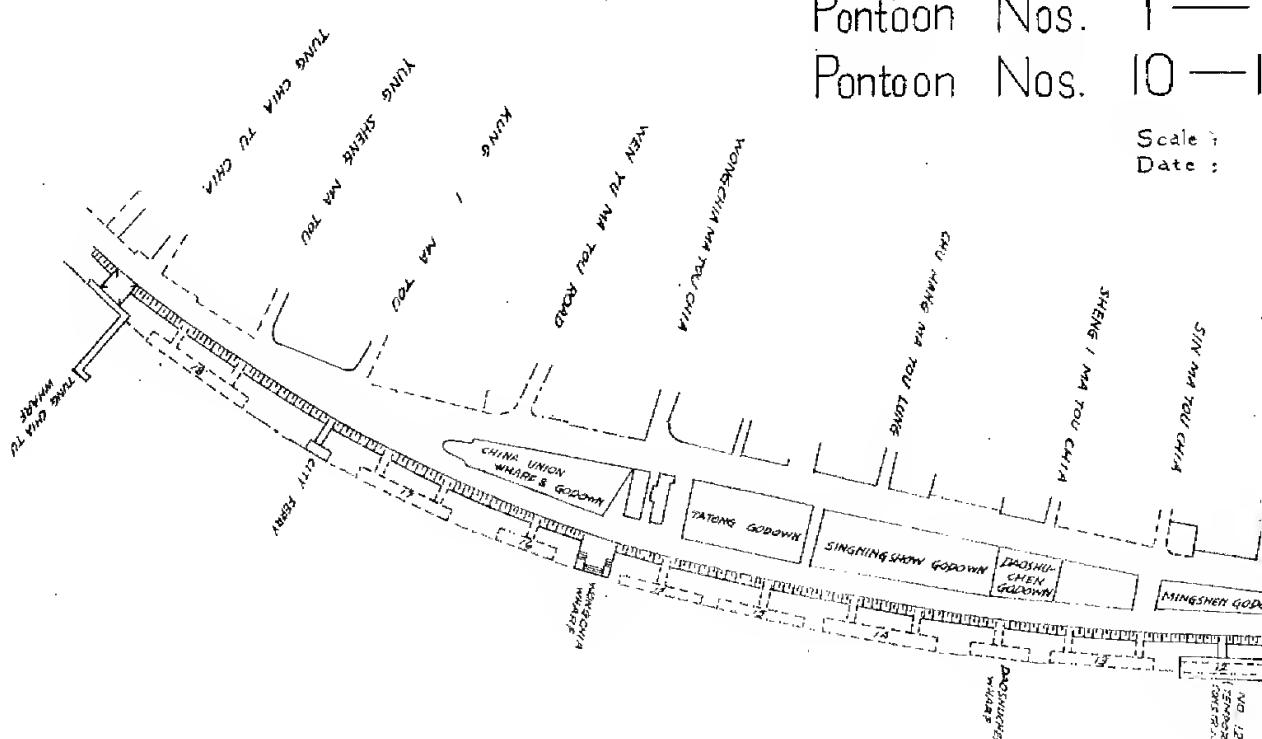
Pontoon Nos. 10 —

Scale :
Date :

SIR ROBERT CAMPBELL

5/15

100



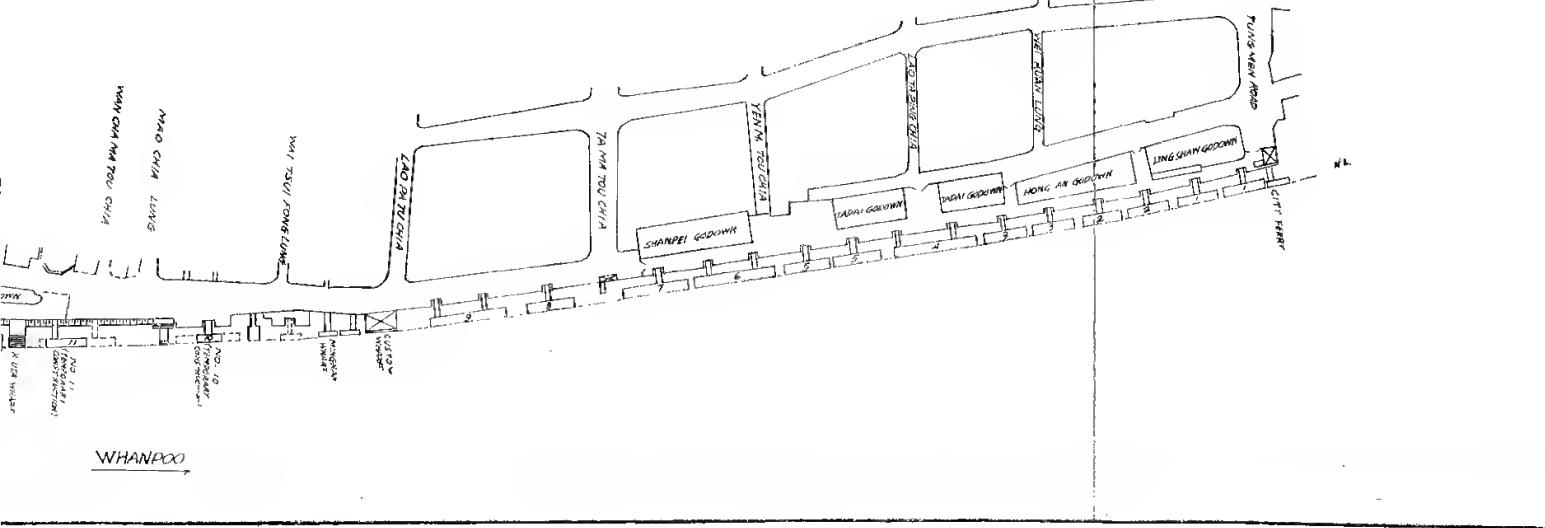
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NANTAO WHARF

9 Completed in Jan 1948
8 under Construction

1:2400
7/14/1948



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The silt-dredging work for the first nine wharves was started early in November, 1946 and completed in May, 1947. Silt-dredging work for wharves Nos. 10 to 12 was mostly finished in November, 1947. The total quantity of silt dredged amounted to over half a million cubic yards, coal consumed 6,500 tons, at the expense of about two billion dollars.

The construction and fixing of the first nine wharves began in February, 1947. As far as possible, old equipment was repaired and utilized. Other equipment required was bought from CNRRA and marine merchants. The total expense amounted to over seven billion dollars. The wharves would provide adequate berthing places for 18 vessels simultaneously. The estimated annual tonnage of cargoes which the nine wharves may accommodate is two million tons, or 15 percent of the center tonnage of Shanghai.

"The nine new wharves will undoubtedly serve shipping requirements of the City, and I am very glad to report that our concerted efforts have borne fruits beneficial to the public," Commissioner Tsao said. "But I must remind the public that there are still nine more wharves to build, three of which are now having temporary wharves as a stop-gap, while the remaining six have been occupied by military organs, which we anticipate to take over in due course. There may be financial difficulties and difficulties in acquiring the now scarce but necessary equipments. Again we have to appeal to all parties concerned for cooperation and support," he said.

After the visit to the Nantao wharves, the inspection party went to Lokapang to see the Ciuy Truck Ferry Service in operation. They unanimously agreed that until the Whangpoo River can be spanned by a bridge or a tunnel, the truck ferry service is the most effective substitute. They heartily concurred with Commissioner Tsao's opinion that the successful operation of the truck ferry service has the same effect as moving godowns in Pootung, on the East side of the River, to Shanghai, on the West side. The visitors, especially the City Councillors, expressed satisfaction over the accomplishments of the PUB under present adverse conditions and highly commended Commissioner Tsao for his untiring efforts in administering the public utilities of Shanghai, not only solving many immediate problems but also laying the foundation for the future prosperity of Shanghai.

(North China Daily News, January 27, 1948)

GOOD WORK

The report of the visit to the rehabilitated Nantao Wharves is interesting as recording work done by the Shanghai Govern-

ment authorities which escapes the eye of the ordinary resident in this city. Nine wharves have been restored and another nine have to follow suit, after which it is presumed that Shanghai will be restored to the 1937 situation so far as this type of harbor accommodation is concerned. It is to be hoped that the authorities will be just as quick in carrying out the second part of their program as they have been doing the first, for it is clear that all this accommodation is necessary if the doorstep of Shanghai is to be restored to its former condition. It will be remembered that after the sinking of the boom up river from Shanghai in 1937, the Bund foreshore, which up to that time had been a pleasure of green lawns and cleanly surroundings, had to be used to take care of the small coastal vessels which were still able to ply in and out of Shanghai. The question of the restoration of the Bund has already been mooted, and hopes have been created that the Bund of the future will look like it did in the better years instead of like a very unkempt wharf. It is a consummation devoutly to be hoped for, because a visitor's first impression of Shanghai, when arriving at the pontoons along the Bund is not at present a happy one. By putting the coastal vessels back to the places whence they operated before, not only will the first impressions of Shanghai be improved, but it is more than possible that the traffic congestion on the Bund itself will be relieved.

(Editorial of "North China Daily News," January 28, 1948)

PART VII TELEPHONE

1. STATISTICS OF TELEPHONE

January, 1946—September, 1948

TIME	Number of Lines	Number of Sets	Average Number of Daily Calls
January, 1946	61,064	88,937	542,500
February	59,969	87,201	579,900
March	60,288	87,492	632,900
April	60,585	87,988	635,900
May	60,949	88,600	617,600
June	61,060	89,087	618,100
July	61,154	89,442	621,600
August	61,306	89,739	621,700
September	61,621	90,801	641,500
October	61,760	91,424	682,400
November	61,816	91,435	664,800
December	61,900	91,474	668,600
January, 1947	62,056	91,577	690,200
February	62,145	91,657	646,200
March	62,253	91,777	700,200
April	62,350	91,846	699,600
May	62,393	91,840	745,500
June	62,488	91,847	755,600
July	62,765	92,329	747,700
August	63,006	92,773	689,600
September	63,107	93,000	704,400
October	63,405	93,431	735,400
November	63,581	93,948	725,300
December	63,687	94,920	717,400
January 1948	63,886	95,207	706,600
February	64,029	95,371	680,100
March	64,121	95,547	688,700
April	64,402	95,853	715,100
May	64,578	96,098	680,100
June	64,765	96,350	712,200
July	64,906	96,618	709,900
August	65,002	96,719	666,200
September	64,817	96,570	544,000

PART VIII TARIFFS OF UTILITIES

1. REVISION OF PUBLIC UTILITIES RATES EXPLAINED BY TSAO

Stressing the importance of public understanding and co-operation in the adoption of the "automatic formulae" for revision of utility services, PUB Commissioner T. C. Tsao delivered a speech explaining the formulae in detail at a meeting yesterday afternoon called by Mayor K. C. Wu and attended by Mr. K. C. Pan, chairman of the City Council, and chairmen of various sub-committees of the City Council.

Mayor Wu opened the meeting with a brief speech supporting PUB's policy. Then followed Commissioner Tsao's report, to which the City Councillors reacted favorably. The automatic formulae, which were included in his speech, were omitted here because of their length, but Mr. Tsao's main points were as follows:—

1. **Characteristics of Public Utilities:** I shall start by stating, briefly, the characteristics of public utilities. They have to offer service, without discrimination, to the general public. They have to maintain continuously their service at a reasonably good standard, yet they are not permitted to make any money outside the legitimate profit granted by their respective franchises signed between the Government and the operating companies. In so far as they are not allowed to discontinue the service, they are not in a position to run at a loss.

Formulae Flexible

2. **The "Automatic Formulae":** Since January 1, 1948, the use of "Automatic formulae" has been granted by the Executive Yuan in order to have an equitable and uniform base for the utility tariffs throughout China. To suit local conditions of different cities, the application of the "automatic formulae" is flexible to the extent that is within the right vested in the hands of the local governments. It can naturally be deduced that the "automatic formulae" have been devised not for the purpose of "automatic revision," which sounds so burdensome to many poor consumers but rather with the object of facilitating the checking and supervising of each necessary revision by the local government. The Central Government still reserves the right of approving the constants used in the given formulae from time to time in order to make them as realistic as possible.

Constants And Variables

3. The Elements of the Formulae: The "automatic formulae" contain two things, the constants and the variables. The constants, such as pounds of coal used in generating one kwh of electricity, are approved by the National Economic Council after detailed studies of the operating accounts of the utility companies. The variables, officially announced at the end of each month by respective officially organs, are as follows:—

Fuel costs:—Fuel Control Commission.

Metal price index:—Shanghai Municipal Government.

Foreign Exchange:—Central Bank of China.

Cost of Living Index:—Shanghai Municipal Government.

Following the adoption of the formulae, the inherent reason lying under each revision of utility tariffs must be clear to all. The utility tariffs are merely reflections of the fluctuations of the different variables. Whenever there is a general increase or decrease in the variables, utility tariffs necessarily follow.

4. The Need of Improvement in Efficiency: It is to the public that we appeal for understanding and sympathy. Reviewing the past records, I am happy to say that the quantity of coal for generating one unit of power has been considerably decreased and the leakage of water is greatly reduced, all representing courageous and ardent efforts of the companies' managements and engineering staffs. Hereafter we shall all the more devote our energy to improve the efficiency of utility so that the constants in the formulae may be proportionally decreased.

It seems that while we are caught in the storm of inflation, our efforts, however strenuous, in enhancing the efficiency of the operational costs, are automatically overshadowed. Yet the ironical fact remains that the inflationary storm is virtually out of our control.

Always Checking Accounts

Another point worth mentioning here is that we have always been checking the accounts of the utility companies, sometimes employing chartered accountants. Our purpose is to find out the true financial status of the companies and whether the rates are justified or not. In passing, I may mention one of the utility companies has been instructed by my office not to raise any payroll in 1948 due to their relatively poor efficiency.

I need not over-emphasize here the importance of utility services to Shanghai. The shutting down of power plants for half a day will mean losses that are at once incalculable. In saying the above I bear no ill will to anybody. I only hope that

the public will understand as well as appreciate that in all our efforts in maintaining the utility services we have as our primary consideration the interest of the public. In doing justice to the utility companies we are really doing justice to the public.

How Companies Operate

5. Economic Turn-over of Utility Companies: I may take the opportunity to expound on the subject of how at present the economic machinery of the utility companies is operated. By giving equitable tariffs to the utilities, we actually include appropriate amount of depreciation fund and legitimate profit. Since the end of the war, the companies, with the exception of the Shanghai Power Company which has bought new generator by additional investment, have utilized the allowed amounts to purchase from the Government foreign exchange in order to buy necessary equipment for expansion purposes. The allotment of foreign exchange may not be sufficient to meet their actual need but they are getting the exchange quota from time to time.

6. Foreign Investment & Task of PUB: My task is manifold. Firstly I have to enable the utilities to maintain adequate services. Secondly, I have to consider the burden of the public. Thirdly, I have to enforce government regulations. Last, but not least, I have to show the sincerity of the Government in encouraging foreign capital to invest in utility enterprises in China. However, my difficulties appear also many. The cause is one, that of the storm of inflation. Although tariffs are kept as reasonably low as possible, yet they still appear bulky and they are hardly bearable to many salaried employees. The cost of living index has been plotted on a log sheet. In 1946, it was a straight line, but starting from 1947 it became a parabolic curve with a steepness equivalent to a monthly compound interest of 27 percent. Without the timely stoppage of the inflationary storm, I am afraid that this year will be a even more difficult one.

I hope that I have made myself clear. I shall conclude here by thanking you for your coming over and support.

(The China Press, January 10, 1948)

2. FORMULAE FOR COMPUTING UTILITY TARIFFS

The following formulae for computing equitable utility tariffs were promulgated by the National Economic Council of the Central Government and were effective as from January 1, 1948. The prices of fuel should be those announced by the Fuel Control Commission; foreign exchange rates those announced by the Central Bank; and the cost of living index and metal price index those announced by the local governments.

1. ELECTRICITY:

$$\text{Tariff per kilowatt hour} = xa + \left(\frac{10}{100} y + \frac{80}{100} z + \frac{10}{100} w \right) b$$

a = constant for fuel consumption per kilowatt hour in kilograms per kilowatt hour

b = constant for operating expenses per kilowatt hour in dollars per kilowatt hour

x = prevailing price of fuel in dollars per kilogram

y = cost of living index in Shanghai

z = cost of living index at place concerned

w = metal price index at the place concerned

2. WATER:

$$\text{Tariff per cubic meter} = f (ax + by + cz + dw + ev)$$

a = constant for coal consumption in kilograms per cubic meter

x = prevailing price of coal in dollars per kilogram

b = constant of foreign exchange required per cubic meter

y = prevailing foreign exchange rate

c = constant for salaries, wages, and costs of materials per cubic meter

z = prevailing cost of living index

d = constant for consumption of electric power in kilowatt hours per cubic meter

w = prevailing tariff of electric power per kilowatt hour

e = constant for consumption of oil in kilograms per cubic meter

v = prevailing price of oil in dollars per kilogram

f = coefficient

3. GAS:

$$\text{Tariff per unit (one hundred cubic feet)} = f (ax + by + cz + ex)$$

a = constant for coal consumption in kilograms per unit

x = prevailing price of coal in dollars per kilogram
 b = constant for foreign exchange required per unit
 y = prevailing foreign exchange rate
 c = constant for salaries, wages, and costs of materials per unit
 z = prevailing cost of living index
 e = constant for consumption of oil in kilograms per unit
 v = prevailing price of oil in dollars per kilogram
 f = coefficient

4. TELEPHONE:

Tariff per call = $f (by + cz)$
 b = constant for costs of metal materials per call
 y = prevailing metal price index
 c = constant for salaries, wages, and costs of materials per call
 z = prevailing cost of living index
 f = coefficient

5. TRAMS AND TROLLEYS:

$$\text{Average fare per passenger ticket} = \frac{f (by + cz + dw)}{m} \times 110\%$$
 b = constant for foreign exchange required per vehicle kilometer
 y = prevailing foreign exchange rate
 c = constant for salaries, wages, and costs of materials per vehicle kilometer
 z = prevailing cost of living index
 d = constant for consumption of electric power in kilowatt hours per vehicle kilometer
 w = prevailing tariff of electric power per kilowatt hour
 m = average number of passengers per vehicle kilometer
 f = coefficient

6. SMALL-GAUGE RAILWAY:

Fare per passenger kilometer = $f (ax + by + cz + ev) 110\%$
 a = constant for coal consumption in kilograms per passenger kilometer
 x = prevailing price of coal in dollars per kilogram
 b = constant for foreign exchange required per passenger kilometer
 y = prevailing foreign exchange rate
 c = constant for salaries, wages, and costs of materials per passenger kilometer
 z = prevailing cost of living index
 e = constant for oil consumption in kilograms per passenger kilometer

v = prevailing price of oil in dollars per passenger kilometer
 f = coefficient

7. BUSES:

$$\text{Average fare per passenger kilometer} = \frac{f (by + cz + e_1 v_1 + e_2, v_2)}{m} \times 110\%$$

b = constant for foreign exchange required per passenger kilometer
 y = prevailing foreign exchange rate
 c = constant for salaries, wages, and costs of materials per passenger kilometer
 z = prevailing cost of living index
 e_1 = constant of gasoline consumption in gallons per passenger kilometer
 v_1 = prevailing price of gasoline in dollars per gallon
 e_2 = constant of diesel oil consumption in kilograms per passenger kilometer
 v_2 = prevailing price of diesel oil in dollars per kilogram
 m = average number of passengers per vehicle kilometer
 f = coefficient

8. FERRY:

$$\text{Fare per passenger knautical mile} = f(ax + by + cz + ev) \times 110\%$$

a = constant for coal consumption in kilograms per passenger knautical mile
 x = prevailing price of coal in dollars per kilogram
 d = constant for foreign exchange required per passenger knautical mile
 y = prevailing foreign exchange rate
 c = constant for salaries, wages, and costs of materials per passenger knautical mile
 z = prevailing cost of living index
 e = constant for oil consumption in kilograms per passenger knautical mile
 v = prevailing price of oil in dollars per kilogram
 f = coefficient

3. DANGER OF ECONOMIC COLLAPSE

"Whenever the utility tariffs are revised at the beginning of each month," declared PUB Commissioner T. C. Tsao at the 5th plenary session of the Shanghai City Council in a very deeply concerned way, "I not only see the increased burden of the public and greater difficulties of the utility companies in maintaining the utility services, but also visualise the imminent danger of the possible economic breakdown of the nation."

Caught in the inflationary storm, the tariffs of electricity and other utilities can not help following heels to the rise of commodity prices.

"If the state of affairs is allowed to continue indefinitely, I am afraid that the national economic structure may finally collapse.

"In making this introductory remark, I am not at all trying to be impressive. I am requesting you Councillors to consider the over-all economic picture of Shanghai and China which has very great effect upon the utility rates."

Candid Survey

Commissioner Tsao then proceeded to make a candid survey of the important work done by the Bureau of Public Utilities. The report was followed by the interpellations of the City Councillors. Among the many questions asked the most important were the application of the "automatic formulae" for revision of utility tariffs, and restrictive charges for electricity.

"The work of PUB," Mr. Tsao said, "can be divided into two main categories. The first is to promote long range plans designed to serve the ultimate needs of the community; while the second is to effect the expedient solutions of immediate problems that have confronted us."

United Power Company

For the long range plans we have the United Power Company Project which has been submitted to the Central Government for final ratification and the United Transit Company Project now under careful study.

Regarding the expedient solutions we may mention the digging of artesian wells in the Western District to cater to the ever-increasing demand for water supply and the building of reservoirs for better distribution of water.

Buses

We have also been increasing the number of buses every month; hoping to add sixty more buses into service by the June.

Ferry

The truck ferry service inaugurated last October is now carrying more than 60 trucks across the Whangpoo River every day. The service aims at the temporary solution of the problem of cross river communication before the Whangpoo may be spanned by a bridge or tunnel.

Two Guiding Principles

Mr. Tsao then went on to stress two of his guiding principles in the administration of utilities of Shanghai; namely, respecting the franchises of the companies and enforcing government regulations. Mr. Tsao's answer to the interpellations of the Councillors is as follows:

1. "Automatic Formulae"

I can well understand the stand taken by some of the City Councillors in attacking the "automatic formulae" simply from the public point of view. I consider that one-sided. I have explained sometime ago the peculiar characteristics of utility companies. The utility companies can not run at a loss, otherwise they have to discontinue the service. The "automatic formulae" have been promulgated by the National Economic Council to serve as an equitable basis for local authorities in scrutinizing and approving revision of tariffs. Although they are called "automatic," they are by no means automatic by themselves. No revision of tariffs will be justified unless the variable contained in the formulae, as COL index, foreign exchange rate, fuel costs, metal costs, undergo substantial increases.

Fluctuation of Variables

The utility tariffs are merely reflections of the various variables. The Councillors may well speak from the point of public burden alone; but the Government must consider two sides, the public as well as the utility companies. At each revision we not only take into consideration the minimum operational expenses of the companies, reasonable depreciation and legitimate profit as authorized by the franchises, and also any possible reduction of the rates by enhancing the efficiency of the companies, but also consider the burden of public.

2. Restrictive Charges

I defy what has been said by Councillor Fei Shu-shen that the measures were handed to the City Council without being care-

fully studied. The measures for restricting the use of electricity to avert a crisis of the local industries had been comprehensively deliberated by the Government and various power companies and the Chamber of Commerce before they were presented to the City Council. It was intended to save electricity but not for the raising of penalties charges. The restrictive charges are a means to an end but not the end itself.

Saved 7,000 KW

The restrictive measures have on the surface saved 7,000 KW but in fact they have saved some 22,000 KW if we take into consideration the big increase in the usage of power that would come up in winter had there been no restrictive measures. It can be testified by one occasion. On one of the coldest days of this winter, there was a sudden rise in the usage of electricity of more than 19,000 KW due to the turning on of electric stoves of many consumers. If there were no restrictive charges, this might happen every day in winter. I have no objection at all to revise or suspend the restrictive measures for summer if the public can co-operate by saving the use of power themselves.

(China Daily Tribune, February 26, 1948)

4. RISE IN UTILITY RATES FAR BEHIND COL INCREASES

Public Utilities Commissioner T. C. Tsao today issued a statement concerning the continued and uninterrupted operations of the city's public utilities, in further amplification of his speech at the City Council meeting this week.

Commissioner Tsao points out that, although there has been criticism regarding utility rate increases, these have been far smaller than the cost of living index, despite the fact that Shanghai's public utility companies, just as any other manufacturer employing labor, are tied to the COL index.

Commissioner Tsao's statement follows:

In my report to the Fifth Plenary Session of the Shanghai City Council, I mentioned the imminent danger of the economic breakdown of the country.

The public utilities are caught among the general confusion and chaos. Owing to their specialized nature, involving elements of cost beyond control, it is well-nigh impossible for them to offer adequate and uninterrupted utility services to the public unless their rates are realistically revised from time to time. A comparison of the increases of the prices of general commodities, "elements" affecting the utility tariffs, and the utility tariffs themselves offers the strongest proof that we have done our best to keep the utility tariffs as reasonably low as possible.

Comparing the general index, which has risen 153,220 times; the average of the "elements" affecting utility rates, which has risen 104,670 times; and the utility rates, which have risen only 59,358 times, a cold fact establishes itself, namely, that the rise in the rates of utility services has been less than the rise of other essential costs.

The accusation that utility rates are taken the lead in the price race is totally groundless. We would like to reveal to the public where the efforts of the Bureau of Public Utilities have been directed and with what results.

Since the time of the "take over," much progress has been made in restoring and rehabilitating the utility plants of Shanghai, all this representing wholehearted and unremitting efforts on the part of the PUB and the utility companies. The achievements have been reflected in the huge increases of the various utility services, notably electricity, gas, bus, and ferry. The facts are plain to all and we need not elaborate them here.

The quantity of coal for generating one unit of power has been considerably decreased and leakage of water greatly reduced. These efforts in enhancing the efficiency and thereby reducing the operational costs would be clearly reflected, during normal conditions, by decreases of the rates for electricity and water. Unfortunately in the present economic chaos they are completely overshadowed.

The application of the "automatic formulae" is flexible to the extent that lies within the right vested in the hands of the local government.

The "automatic formulae" have been promulgated by the National Economic Council of the Central Government to serve as an equitable basis for local authorities throughout the nation in scrutinizing and approving revisions of utility tariffs. Although called "automatic," they are by no means automatic within themselves.

No revision of tariffs will be considered justified unless the quotations of the variables contained in the formulae have been revised, the authority and responsibility for which revisions lie in the hands of their respective official organs. Fuel Control Commission has charge of fixing the prices of fuels, Shanghai Municipal Government has jurisdiction over the announcing of the C.O.L. Index and the Metal Price Index, while the rate of Foreign Exchange is under the control of the Central Bank.

The Bureau of Public Utilities has no control whatsoever in the revisions of the quotations of the several variables. Our efforts can only be directed to the reduction of the "basic constants" in the "automatic formulae" by enhancing efficiency and decreasing operational costs. All of our efforts in increasing the utility services have been overtaken by the rise of population which has steadily increased since the time of the "take over." The universal shortage of essential materials and lack of funds for expansion and investments impede the smooth progress of the rehabilitation of Shanghai's utilities. The supply of power for instance is still admittedly inadequate and so are transit facilities. Long range plans designed to cater to the ultimate needs of the local community, such as the United Power Company Project, have been promoted but need more substantial support before they can be realized.

The adverse reaction of the public to each revision of utility rates, presumably reflected in the recent attack against the PUB in the City Council, prompts me to make a study of the various causes, the results of which prove to be intensely interesting.

First of all, bills for utility services are current expenses which must be dealt with promptly. The various bills add up

to a sizable sum. Unlike other commodities, no hoarding of utility services can be made and the impact of every revision is felt and borne every month.

Unlike other commodities, the prices of which are at present rising daily, the utility rates under government supervision can only be revised monthly and these within the limits of a formula. It is rather illogical to oppose the rise of the scientifically calculated utility tariff, while other commodities are totally out of harness like wild horses?

The third and maybe the strongest reason is the irregular increase of earning power of individuals, which has varied greatly since the close of the last war. The workers are among the lucky groups who get paid by the C.O.L. index and whose minimum basic wage increase from \$16 in the pre-war days to \$37 now. Basing upon the January index of 95,200 workers got for that month \$3,522,400, or 220,000 times their pre-war income. Government employees whose basic salary is \$100 received only \$4,671,000 in January or only 46,710 times their pre-war income.

(Shanghai Evening Post & Mercury, March 6, 1948)

5. ON VICIOUS SPIRAL OF COSTS, PRICES

T. C. Tsao

Soaring prices of commodities, labor and services in Shanghai have stepped up the run-away tempo with ever increasing momentum. The rate of increase taking the form of geometrical progression, has reached such flagrant, cynical, and oppressive proportions that the governments, national, provincial, or local are at the end of their means, commerce and industries are on the verge of complete breakdown and the mass of the population who are poor but honest and industrious are threatened with the annihilation of their very meager existence.

It is a curse, a plague and a number one headache of the nation.

As an official whose unpleasant duty involves the maintenance of fair utility services at fair prices or rates, and as an individual who appreciates the pinch of hard living, I whole-heartedly join the city councillors, citizens and everybody else in expressing the utmost grief over the situation and yelling for a halt to this onward march of insane costs and prices.

It is apparent to everybody that in a country where civil war is going on, villages and farms are deserted, transportation is disrupted, military operations draw heavily on resources, and control measures are largely ineffective, the only course of events naturally leads to shrinking supplies and swollen prices.

Vicious Spiral Of Costs And Prices

In the world of today, the economic structure is so highly complicated, interwoven and fragile that a seemingly small breach may result in a total collapse of the economic dam. Besides the economic warfare which might be carried out subversively by the rebels in this metropolis and elsewhere, there are certainly very few Neroes who would be insane enough to fiddle at the burning of the economic structure. Nobody should be illusioned by the seeming blessing of the ever-increasing prices as no one gains in this economic upheaval in which rising prices and mounting costs follow each other in spirals.

Higher COL index inflicts upon the administration, production, merchandising, transportation and servicing with higher costs which, in turn, push the next COL index to a new high. Swollen foreign exchange rates and stock market quotations will have re-

percussions on commodity prices and vice versa. So mounting costs and rising prices are rampantly spiralling to such dizzy heights that things are ever nearer to the catastrophic collapse of the entire structure unless something drastic be done to change the trend.

The spiral works havoc indiscriminately to all industries, mercantile houses, industrial families and every conceivable corner, which, as a whole, were probably responsible for the birth of the vicious monster and are still contributing, of necessity, to the nursing of it, so as to keep their respective heads above water. So in this wild goose chase, everybody has to take a certain amount of blame, but nobody can particularly be blamed for the hardships and suffering of the community.

The Public And Its Utilities

The primary obligation of the utility companies is to offer efficient services to the public at equitable rates or prices. It is my duty to see that such services are fair, satisfactory and efficient and the citizens have a right to demand them. The officials as well as the public know definitely that the welfare of the community, in the form of health, economy, convenience and comfort, is very much related to the supply of such services, the interruption of which will result in the spread of diseases, unemployment and dislocation of industries and commerce.

The public has the absolute right to demand such services in accordance with the terms of the franchise by which each utility company is most unequivocally bound. At the same time, the public on receiving such services must permit the utility companies to receive fair rates or prices to which they are, under the terms of the franchise, justly entitled. Utility services offered without fair compensation mean confiscation, which, if not prosecuted through due process of law, should not happen under modern democracy. Without fair compensation, the maintenance, replacement, repairs, operating efficiency and therefore the service of the utilities will deteriorate and eventually may breakdown and fail to supply the service. We should not demand that a horse should be good and strong and yet hope that it will eat no straw, as an old Chinese saying has it.

Utility Costs and Prices

The following table gives the indices of various utility charges as of February, 1948 and of the principal items for the same month; the indices being based on the first half of 1937 as unity. The items of the latter group form the principal components of utility costs.

Utility Rates Indices

Water	98,215
Electricity	56,750
Gas	98,947
Telephone	56,000
Bus	93,500
Tram	77,800
Ferry	60,000
 Average	 91,601

Indices for Costs

C.O.L.	151,000
Foreign Exchange	44,700
Coal	300,000
Gasoline	70,000
Metals	169,710
 Average	 147,080

From an analysis of these indices, a very plain fact establishes itself, namely, that the rise in the rates of utility services is no where nearly as much in proportion as the rise of the component items which go to make up the costs of the utility services. Lagging behind among the items that constitute the cost of living in the race of prices, its aggravating effect on the C.O.L. index is by no means as much as the adverse effect of other items. Therefore, it is the utilities that have more ground to grumble for not being given a chance of achieving parity with commodities, labor, etc. which are also under government control.

In this respect, I would like to record appreciation of certain utility companies which had shown un-remitting efforts in serving the public, and in giving the government valuable and full cooperation without which the present situation would have become much worse and the economic malady greatly aggravated. An understanding of this sort plus the spirit of mutual sympathy and fair play will ensure good relationship between the public and its utilities to the benefit of all.

Inflation

All the economic ills can be attributed to inflation which is national in scope and is beyond the reach of the city to rectify. So long as inflation continues, there will be no possibility of stopping the increase of prices including rates of utilities. Unless

and until genuine peace and order be achieved in this land and production and transportation be rehabilitated to normal, only a miracle will stop the inflation, even allowing some moderate foreign aid. It will be wise to tide over this darkest period before dawn by working cooperatively between conscientious arrangements and the enlightened public under the guidance of the government's experienced experts.

(North China Daily News, March 8, 1948)

6. SMG STAND ON UTILITY TARIFFS CLARIFIED

In an exclusive interview yesterday with a representative of the "North-China Daily News," Dr. T. C. Tsao, Commissioner of Public Utilities of Shanghai, answered a number of questions designed to clarify the fundamental policies of the Bureau of Public Utilities and to present a clear and satisfactory explanation for the recent periodic adjustments of utility rates and the efforts of the PUB in curbing the rise.

1. What is the policy of the PUB in administering the utility services of Shanghai?

A.—The fundamental policies of the PUB in administering the utility services of Shanghai are expansion of services, enhancing of efficiency, and rationalization of tariffs. Prior to the year 1947 when commodity prices were not rising as much as now, improved efficiency resulted in relatively stable rates of the utility services. Public opinion favoring the PUB was reflected in a poll conducted by the "Ta Kung Pao" in spring, 1947. Since then, however, commodity prices have increased much more speedily and the efforts of the PUB in improving efficiency have often been neglected by the public. A good example of the remarkable improvement in efficiency is the decrease of 3.8 pounds of coal to 2.2 pounds for the generation of one kilowatt of electricity. Unfortunately during the present economic upheaval in which prices of commodities register substantial increases frequently, such efforts of the PUB are overshadowed. It is indeed regrettable that instead of decreasing the tariffs proportionally to the reduced operational costs, in this instance reduced coal consumption, the PUB had to approve increases in the utility tariffs.

2. What are the utility tariffs of Shanghai compared with the tariffs of other cities in China and compared with other commodity prices?

Lower Tariffs

A.—The utility tariffs of Shanghai are lower than those of other cities. In comparison with cities near Shanghai and of about the same price level:—(a) Water; one cubic meter of water in Shanghai sells for CN\$26,200 (Average rate of all companies), while in Nanking the same amount sells for CN\$33,000.

(b) Electricity: average rate per kilowatt in Shanghai is CN\$24,500 (CNS\$22,400 for the Shanghai Power Company, while the rate in Nanking is \$29,500 and in Hangchow \$34,500. From the above it can be seen that the utility rates in Shanghai are lower than those in other cities.

When compared with the prices of other commodities, the utility rates of Shanghai have increased in a much smaller proportion. Taking the prewar price level as the unit, price of rice in March rose 380,000 times, the price of cotton yarn on April 9 came up to 448,000, but electric power rate on the same day was only 138,000 times, telephone 123,000 times, and the rates for other utility services increased in about the same region.

3. What are principles in the fixing of utility rate?

A.—The Legitimate profit of utility services has been specified by the franchises not to exceed 10 percent per annum. In the present circumstances, even this amount of legitimate profit is difficult to obtain. The companies are quite often only able to receive enough to cover the necessary operational costs. If the utility companies are to continue serving the public and yet are not allowed to procure the minimum amount required for covering their operational costs they naturally will not be able to continue their operation.

This is like killing the goose that lay the golden eggs and is, to say the least, most unwise. The necessary operational costs include: fuel, labor, equipment, accessories and depreciation of machinery. These elements make up the utility rates.

Labor costs are based on the COL Index, coal costs based on the coal prices fixed by F.C.C., and maintenance material costs based on the foreign exchange rate. If the above factors do not increase, the utility services have no right in demanding any increase. The "automatic formulae" are really very equitable in that when the factors in the formulae are kept stable the utility rates will automatically be stable.

Stabilization

4. How would SMG partially stabilize the utility rates at present?

A.—Public utilities are only a part of the whole economic system. Their rates are adjusted only as the factors in the formulae are adjusted. The stabilization of the rates of course depend on the stabilization of the whole economic system of the nation, in which alone lies the fundamental solution.

Expedient solutions which are within our power of execution for the partial stabilization of utility rates consist of: For fuel oil and necessary maintenance materials and other supplies we have been endeavoring to obtain foreign exchange in advance. For COL Index, the competent authorities have been trying such means as the extension of the ration system to stabilize the index.

If the above are realized the operational costs can be reduced and the utility rates need not increase so much. Mayor Wu and Commissioner Tsao, with the collaboration of Governor Chang Chia-gnau, have been working in that direction. Commissioner Tsao explained that the revision of utility tariffs was compelled by the rise of commodity prices. It was his sincere hope that all parties concerned and the public would understand the difficult situation and exert their efforts to check the general price race. With cooperation from all sides, he hoped that the utility rates would be gradually stabilized.

(North China Daily News, April 26, 1948)

7. ECONOMICS OF UTILITIES

On the invitation of the Utility Investigation Sub-Committee of the Shanghai City Council, Dr. T. C. Tsao, Commissioner of Public Utilities, has submitted a report explaining the general economic conditions of the utility companies and PUB's efforts along various directions in stabilizing the utility tariffs for May.

Commissioner Tsao's report ran briefly as follows:

I. GENERAL ECONOMIC CONDITIONS OF THE UTILITY COMPANIES.

A. Salaries and Wages. Basic wages of workers have, due to the demand of labor with the ratification of the Bureau of Social Affairs, increased greatly. Average daily wage of a worker in pre-war days was about sixty cents, while at present it is more than one dollar. Including the extra welfare allowance of seven dollars a month, the total basic wage for a worker is CN\$37. This multiplied by the rising cost of living index invariably reaches enormous sums to constitute a great portion of the operating expenses of the utility companies. Basic salaries of the staff have been calculated by a sliding scale passed by the Cost of Living Index Application Committee of the Municipal Government and approved by the Mayor. The scale applies more discounts to employees with higher basic salaries and hence is more unfavorable to them. The recent dissatisfaction expressed by the local foreign employees of Shanghai Power Company through the press verifies this point.

B. Foreign Exchange. Inadequate supply of foreign exchange is one of the main factors affecting the costs of utility services. A part of the essential materials fails to secure necessary exchange and has been purchased either from local importers or manufacturers, with prices anywhere from four to six times higher than those imported by the companies themselves. The new ruling governing foreign exchange for imports, unless special grace be given to utility companies to import under the old ruling, will necessitate further increases in the costs and even make estimates for them impossible.

C. Depreciation and Legitimate Profit. Although the computation of operational costs gives provision to equitable depreciation and legitimate profit, a careful analysis of the expenditures of the companies at the end of each month reveals that they are liable to be covered only partially. It is a special trait during the inflationary storm that the estimates for operating expenses made at the beginning of each month are bound to be exceeded

when the expenses are actually met by money collected from the consumers. The excess in the expenses is met by cutting into the percentages of revenues intended for depreciation and profit. Inadequacy of provision for depreciation if allowed to continue for a lengthy period of time makes the companies unable to make necessary equipment replacements and will consequently result in poorer operational efficiency of the companies. Insufficiency of legitimate profit makes expansion of the services impossible. The case is a serious one and no doubt needs early amelioration.

D. Efficiency. Improvement of efficiency can be divided into two sides: (1) Improvement possible without resorting to replacing the equipments. To this end, the PUB has spared no efforts. However, under the present circumstances supply is unable to meet demand. We have to use whatever coal, regardless of quality, supplied by the Fuel Control Commission, and we call ourselves fortunate to have all the generators in our possession operating, without being too particular about their coal consumption or even efficiency. (2) Improvement to be achieved through additional equipments. The present financial conditions of the companies do not allow any large scale addition of equipments. Another difficulty will be the acquisition of sufficient foreign exchange, not mentioning the difficulty of attracting such investments from abroad.

E. Cost of Coal. Coal needed for the generation of power now costs over a million times more than in pre-war days; but the tariff of power has been only something more than one hundred thousand times. The relatively small increase is made possible partly through savings effected in the expenditures and partly through the extremely high load factor forced by insufficient power supply and the consequent staggering. A portion of manufacturing factories has its power supply cut off during peak load hours, while another portion is compelled to use electricity during night. The load factor in Shanghai is at present the highest in the world. It is one of the reasons responsible for the low rates. Of course such condition is non-existent during normal times.

II. EFFORTS OF THE PUB IN STABILIZING THE UTILITY TARIFFS IN MAY.

A. Coal Supply. The negotiations of the PUB with the Central Bank and the Fuel Control Commission for coal allotments to utility companies in May resulted in the allocation of 15,953 tons from the Central Bank at CN\$7,321,000 per ton c.i.f. Shanghai, 3,168 tons (transported from Chinwangtao) from the FCC at \$7,321,000 per ton, 11,779 tons of imported coal at April price of \$9,200,000 per ton, and 15,000 tons also from the FCC at May price of \$9,464,000 per ton. Utility tariffs for May were computed

from the above coal prices. Complications arise when the Central Bank is only willing to allot the 15,953 tons at April, f.o.b. price in Chinwangtao with freight and other expenses to be paid according to May rates of the FCC, price per ton will then be \$8,524,000 instead of \$7,321,000. The utility companies are unable to bear the increases. The matter awaits the return of Governor Chiang Kia-gnau from Nanking for a final settlement.

B. Fuel Oil. Upon the request of the PUB, the Central Bank kindly approved the foreign exchange required for the purchase of fuel oil of May for the utility companies at the rate of \$324,000 per U.S. dollar. Dollar exchange thus obtained amounted to U.S.-\$423,900 for the Shanghai Power Company and U.S.\$149,185 for the other companies using fuel oil.

C. Customs Duty. The Shanghai Municipal Government had written to the Executive Yuan, the Ministry of Finance, and the Customs Directorate General requesting that the import duty on fuel oil required by the utility companies be levied according to the exchange rate at the time of obtaining the exchange and placing the order (payment of duty to be made at the same time). Recent letter of the Customs Directorate General said that if the oil companies do not alter their selling prices the customs' appraisement will not be increased. In other words, if there is a change in oil prices duty will be levied according to the market price at the time of import. The oil companies, though having received payments for fuel oil ordered by the PUB for the utility companies to meet their May requirements, are now demanding additional payments to cover the increase of customs duty. The matter is at present still under discussion.

What has been stated above indicates clearly that the low increases of utility rates in May, the increases being below 20 percent, are possible because part of the coal was bought at April prices and foreign exchange for fuel oil was obtained in advance. However, price of coal allotted by the Central Bank still remains to be settled and customs duty for fuel oil may not be decreased.

The Mayor has requested the Executive Yuan, the Ministry of Economic Affairs, and the Fuel Control Commission to allot coal needed by the utility companies in June at May prices. He has further petitioned the Executive Yuan to decrease the customs duty for fuel oil required by the utility services and requested Governor Chiang to approve the granting of foreign exchange in advance to the utility services for the import of fuel oil needed in June, all for the purpose of partially stabilizing the utility rates. The results remain to be seen yet. However, even if they prove to be successful and satisfactory, the recent

increases in foreign exchange rates and coal prices will make the problem of lowering the increases of utility rates in June a most difficult one. The Councillors are earnestly solicited to offer their advise and expert opinions to find an equitable, as well as a workable, solution.

(China Daily Tribune, May 25, 1948)

8. UTILITY RATES COMPARED WITH LOCAL PRICES

To refute charges that the utility rates have been taking the lead in the price race, the Bureau of Public Utilities has made a careful analytical study, employing cold statistical figures for a comparison of the utilities rates with the prices of general commodities.

The PUB statement started by stressing that the utility rates as announced at the beginning of each month are calculated with reference to set formulae, which contain constants and variables, such as COL index, foreign exchange, coal price, metal price index, etc. which are announced by the relevant organs in the preceding month.

Furthermore, at each adjustment of the rates the PUB exercised its jurisdiction to ratify rates after careful scrutiny and negotiation with the companies' representatives before final approval of the Mayor. As a matter of fact, instead of taking the lead, utility rates are lagging behind the general commodity prices.

When compared with the prewar level, the increase of the utility rates are less than half as much as those of the general commodities, as proved by the following statistics:

Commodity Indices

Indices for the wholesale price of commodities within the week from June 20 to June 26 as published in the "Shun Pao" on June 28 are as follows:

	Times
Food	1,280,174
Clothing	1,978,946
Fuel	1,513,975
Metal	1,964,835
Construction material	1,845,987
Chemicals	2,698,621
Miscellaneous	1,706,206
Total Index	1,708,481

The substantial increases in the last week will push the total index to approximately 2,000,000 times. In comparison with the above, the statement quoted rise of the utility rates as announced yesterday over prewar rates:

Water:	Times
Retailing	300,000
Ordinary	825,000
Electricity:	Times
Less than 10 kwh	347,000
11 to 30 kwh	463,000
31 kwh and more	578,000
Gas	Times 1,000,000

The increases of the utility rates are very low indeed when compared with the increases in the prices of rice, cloth, coal, etc. The statement urged the public to understand that the utility rates are a direct result of the deterioration of the national economic structure, and unless conditions of the whole nation improve and inflation stops, the City Government is powerless to prevent the increases. The City Government has received many a complaint from the utility companies that the public does not seem to appreciate the fact that whereas the prices of commodities have been more or less out of control and register huge increases daily, the utility rates are increased only monthly.

The City Government, however, realized only too well the low purchasing power of the mass of the populace with whom even the comparatively low utility rates prove to be burdensome. The introduction of the new system of power rates serve to illustrate the efforts of the Government to decrease the burden of the public who due to necessity economize in the use of power. The statement concluded by hoping that the public will understand that the increases of the utility rates are necessary effects of the hikes of prices of the general commodities and only by mutual cooperation and understanding may we pass the present critical period.

(North China Daily News, July 5, 1948)

9. UTILITY RATES FOR AUGUST

New rates for electricity, water, gas, telephone and transit facilities, registering increases of 110 percent to 300 percent were issued following a Municipal Conference on utility rates yesterday.

The new rates will be effective as of August 1 this year.

In order to decrease the burden on lower income groups who economize on the use of gas, electricity, and telephone, the PUB authorities introduced a system of tariffs whereby the small consumers of the above three utilities pay rates considerably lower than the big users.

Commenting on the new rates, Mayor K. C. Wu said that "the increases of the utility rates are an inevitable result of the huge accumulative hikes registered in the foreign exchange rates, due to the Government's change of policy in the exchange rate control, the COL Index and the metal price Index upon which the rates have been calculated."

Long Discussions

The rates were decided after long discussions with the representatives of the various utility companies, presided by Dr. T. C. Tsao, Commissioner of Public Utilities of Shanghai.

The new rates are published below:

Electricity (per kwh)	LIGHTING	POWER	
	10 kwh & less	11 to 30	31 & more
Shanghai Power Co.	\$134,000	\$180,000	\$352,000
Western District Co.			\$294,000
French Company	164,000	218,000	440,000
Chapei Company	180,000	241,000	453,000
Ta Yai Company	234,000	313,000	590,000
Pootung Company	190,000	256,000	503,000
Nantao Company	200,000	280,000	570,000
Telephone (per call)			
1—150 calls			\$100,000
151—300 calls			200,000
301 and more			320,000
Public telephone			100,000
Transit Facilities			
Tram: 1st class,		\$140,000—	\$300,000
3rd class,		100,000—	200,000
Bus:		140,000—	350,000
Ferry: Cross-river			120,000
Long distance	\$85,000	per passenger knot.	
Small-gauge railway:	\$50,000	per passenger kilometer.	

Water (per cubic meter)

Shanghai Waterworks & French Company . . .	\$385,000
Chapei, Inland, & Pootung Companies . . .	500,000

Gas (per 100 cubic feet)

1 to 10 units	\$ 600,000
11 to allotment	1,050,000

The new rates were the official answer to earlier requests by the utility companies for increases ranging from 400 to 600 percent to offset their July deficits. The approximate hikes asked by the utilities were: telephone, 600 percent; water, 500 percent; gas, 450 percent; electricity, 400 percent; and public transit, 400 percent.

At the weekly Municipal Conference yesterday, PUB Commissioner T. C. Tsao had made a report on conditions of Shanghai's public utilities. He remarked that three goals are aimed at by the administration on utilities, namely, increase of supply, improvement of service, and minimizing of price increases.

He further stated that public utilities in a modern city should have a single policy and be under a unified administration. Before the war Shanghai's utility developments were scattered and independent of each other, he said.

Today, the trend is toward unification both in policy and in administration. One of the notable features in this respect, he said, is the plan for a United Power Company. Another example is the fact that the Shanghai Gas Company and the Woosung Gas Works have complete cooperation regarding gas supply.

Pootung Feels Lack

Due to the Whangpoo River, a lack of utility facilities is felt in the Pootung area. This shows that city planning should point to an even development of all areas. The comparatively inadequate water supply in the western suburbs of Shanghai will soon be remedied by the establishment of a Western Shanghai United Waterworks Company, Dr. Tsao said.

Adjustments in utility rates must be made with a view of the public's burden, he continued, but at the same time the production cost of various utility companies must also be considered.

Recently, the foreign exchange rate has risen steeply. So has the cost of living index. Both factors have powerful influences on the cost of utilities. The new measures, including loans from the Central Bank, will stabilize utility rates for at least a month, he said.

Commissioner Tsao then gave the following figures to show the present consumption conditions of Shanghai utilities:

Water	100,000,000 gallons per day
Electricity	100,000,000 kwh per month
Telephone (100,000 consumers)	750,000 calls per day
Gas	4,000,000 cubic feet
Bus	300 vehicles
Tram-cars	400 vehicles
Ferry boats	16 boats
Truck ferry boats	2 boats
Street lamps	18,500 lamps

(The China Press, August 3, 1948)

10. REDUCED UTILITY RATES FOR AUGUST

Reduced public utility rates for August, lower than those approved and published by the Municipal Government early this month by 15 to 20 percent, were published yesterday by the Public Utilities Bureau with the approval of Mayor K. C. Wu.

This reduction was suggested by the City Council and later agreed upon by the utility companies with the understanding that SMG and SCC will acquire loans for them from the Central Bank of China if they suffer deficits at the end of the month because of this special reduction.

The fares for season tickets for buses and trams remain unchanged, in accordance with Article 9 of the regulation governing the issuance of season (monthly) tickets, the PUB said.

Those consumers who have paid for their August bills for water, electricity, gas and telephone, may ask the companies concerned to refund the excessive amounts or deduct them from their bills for September. Those who have not yet paid for their August bills should pay their bills according to the following tariffs.

Reduced Tariffs

(1) Water (per cubic meter): 20 percent less original rate.

	Reduced Rate	Original Rate
Shanghai Waterworks Co.	\$308,000	\$385,000
French Co.	308,000	385,000
Chapei, Inland and Pootung Co.	400,000	500,000

(2) Electricity (per kwh): 20 percent less original rate.

	Reduced Rate	Original Rate
Shanghai Power Co. and Western District Power Company		
Less than 10 kwh	\$107,200	\$134,000
11 to 30 kwh	144,000	180,000
Over 31 kwh	281,600	352,000
For power	235,200	294,000
French Company		
Less than 10 kwh	131,200	164,000
11 to 30 kwh	174,400	218,000
Over 31 kwh	352,000	440,000
For power	293,600	367,000

Chapei Electricity and Waterworks Company

Less than 10 kwh	144,000	180,000
11 to 30 kwh	192,800	241,000
Over 31 kwh	362,400	453,000
For power	302,400	378,000

Pootung Electric Supply Company

Less than 10 kwh	152,000	190,000
11 to 31 kwh	204,800	256,000
Over 31 kwh	402,400	503,000
For power	336,000	420,000

Chinese Electric Supply Company

Less than 10 kwh	160,000	200,000
11 to 30 kwh	224,000	280,000
Over 31 kwh	456,000	570,000
For power	380,000	475,000

Ta Yao Electric Supply Company

Less than 10 kwh	187,200	234,000
11 to 30 kwh	250,400	313,000
Over 31 kwh	472,000	590,000
For power	392,800	491,000

(3) Gas (per 100 cubic feet): 15 percent less than original rate.

Woosung Gas Works and Shanghai Gas Company

Less than 10 units	\$510,000	\$600,000
Over 10 units	892,500	1,050,000

(4) Telephone (per call): 15 percent less than original rate.

1 to 150 calls	\$ 85,000	\$100,000
151 to 300 calls	170,000	200,000
Over 301 calls	272,000	320,000

(5) Tram and Trolley:

First class	\$100,000	\$140,000
	250,000	300,000
Third class	80,000	100,000
	150,000	200,000

(6) Narrow-gauge railway (per person

per kilometer)	\$ 40,000	\$ 50,000
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Loans Asked

Mayor K. C. Wu, SCC chairman Pan Kung-chuan and deputy chairman Hsu Chi-ching, PUB Commissioner T. C. Tsao, and Tu Yu-sheng called on Central Bank Governor O. K. Yui and Deputy Governor S. Y. Liu yesterday morning and asked them to

grant loans to the local public utility companies, so that the companies may have sufficient revolving funds to purchase all necessary supplies and the utility tariffs might be reduced.

Governor Yui expressed deep sympathy with the request brought up by Mayor Wu and the other civic leaders. He said he would go to Nanking and ask the Central authorities for instructions on this issue.

The Committee for Openly Examining the Public Utilities in Shanghai, which was inaugurated on Wednesday, will hold one meeting everyday for six days as from tomorrow. The committee will first examine the power companies and then the telephone, gas, water and transportation companies.

It is expected that the new committee will be able to work out before August 31 other new formulae governing the revision of utility rates as from the month of September.

The meetings will be open and the discussions made therein will be published in all newspapers from day to day. In addition to members of the committee, the finance and accounting personnel of the companies may also attend the meetings. The committee will first examine the account books and other relevant files of the firms from January to June this year.

(North China Daily News, August 20, 1948)

11. ON UTILITY TARIFF, CURRENCY REFORM, AND INCREASE OF PRODUCTION

T. C. Tsao

The problem of equitable utility tariffs which will enable the utility companies to make their ends meet and which will at the same time consider the purchasing power of the general public is becoming more and more impossible owing to the worsening inflationary trend during the last few months.

I am glad and I appreciate very much the invitation of the Ta Kung Pao to give me the opportunity of speaking about this problem and all that goes with it.

The problem is a most knotty one. We must realize that unless the inflationary evil can be uprooted and unless the fast deterioration of the national economic structure can be put to a stop, there is no answer to the problem.

The utility industries which have taken years of building up and which have taken three years of courageous and painstaking efforts of rehabilitation play a vital role in the economic life of Shanghai. Shanghai, the industrial and economic center of China, will be paralyzed without power supply, its public health threatened with shortage of water supply, its commerce deadened without telephone service, and its flow of cargo and passengers brought to a virtual standstill without transportation facilities.

The importance of the public utilities can not be overemphasized. Not only must they be maintained, must they also be improved and expanded to meet the ever increasing demand. The more the public utilities flourish the more the city prospers.

Now let us give a brief comparison of the utility services at the time of the "take-over" and the services at present.

A. Daily water consumption has increased from 40 million gallons at the time of the "take-over" to 100 million gallons now. For a population of 5 million, daily water consumption per capita is 20 gallons. B. Monthly electricity supply was 4 million kwh at the time of the "take-over," it is now 100 millions kwh, nearly seventy percent of which is used by industrial consumers, among whom cotton mills use the largest quantity. C. Gas production increased from 3.5 million cubic feet per day to 4 million cubic

feet. D. Number of subscribers of telephone increased from 86,000 to 100,000. There is now under study a plan of using 6-digit system. E. Public transportation vehicles increased from 380 to 700. The 700 vehicles, however, only cater to the need of transportation of one third of the population. It should be increased to 2,000, which number is believed to be sufficiently large to eliminate the man-driven transports automatically. F. There are now 16 ferry boats spanning the Whangpoo River, as compared with 6 at the time of the "take-over." Every day about 50,000 passengers cross the Whangpoo. G. The Shang-chuen and Shang-nan small-gauge railways have also been rehabilitated to help the transportation of cargoes and passengers in Shanghai's rural districts.

The fundamental requirement of the public utility service is to make it available to all people at all places and all times. Because of this characteristic, it can not be dumped in the market in large quantities, it can not be hoarded, it can not refuse to sell, and it can not increase tariffs at its own will. In this respect, the utility service differs totally from all other industrial and commercial enterprises. Besides, there is a limit set to its legitimate profit. According to the Chinese Electricity Code, the profit of power companies may be as high as 25 percent per annum. However, for the utility companies in Shanghai it is only 10 percent. The limit protects the company, but on the other hand it also protects the consumers. Although the purpose of public utilities is "service," it still must have legitimate profit. Profit is necessary because in the first place it attracts investments and then it is also an indispensable element of reproduction to enable the management to make replacements and expansion and offer better services to the public.

During the present period of national crisis, however, provisions of profit in the tariffs cannot but be waived aside, as the tariff fixed at the beginning of the month can hardly cover more than the maintenance cost.

Since V-J Day, prices of commodities have increased greatly and the national currency is daily depreciating. The costs of materials needed by the utilities for their operation such as fuel oil, coal, spare parts, labor, etc., all have gone up. Under the circumstance, increases of utility tariffs are inevitable unless (1) the companies lose money, (2) the Government subsidizes, or (3) the companies relinquish. Well, the companies are not in a position to loss money. As to subsidy, unless the Government keeps on subsidising, it will bring the increase of tariff level intolerable on its termination. Furthermore, subsidies are unfair, as they in turn will increase the inflation, which will affect the whole popu-

lace of the nation. The companies of course can not close and cease operation. Our only alternative is to have equitable adjustments of the rates from time to time. As mentioned before, we can only disregard profits temporarily and must, however, enable the companies to maintain their services. Frankly speaking, the utility tariffs have been kept down to the minimum.

When it is impossible to curb inflation, the Government has two means of price control (1) laissez-faire policy to let the prices of commodities adjust themselves according to the inflational trend, and (2) low price policy by controlling commodity prices or giving subsidy, if necessary. Within the course of one year, our foreign exchange policy has undergone two radical changes. The first change occurred in August of last year when the Government abolished the fixed official exchange rate of CN\$12,000 (low-price policy) to the open market rate to be officially announced from time to time. In a month's time, the exchange rate doubled. Hereafter, the open market rates had been adjusted following the natural tendency of price increases. In May, 1948, however, the open market rate lagged far behind the increases of prices of commodities and the Government's policy became a low-priced one again. At the beginning of June, 1948 the second radical change occurred when the Government adopted the exchange surrender certificates system which brought the exchange rate from CN\$480,000 to CN\$7,500,000 in a matter of 70 days, representing an increase of 15.6 times. Most of the utilities depended on imported materials for operation and were seriously affected. The total electricity revenues of the Shanghai Power Company in June was 1,466.9 billion dollars, a sum estimated at the beginning of the month to be sufficient to meet the expenditures of the Company. At the end of the month the accounts payable of the Company was 8,103.5 billion dollars, a loss of 6,636.6 billion dollars. Even excluding the accounts payable but not paid, the expenditure of the Company was 1,962 billion dollars, a shortage of 500 billion dollars. This is chiefly due to the change in the foreign exchange policy. With other enterprises, when their income could not meet their expenditures they could shrink their business and reduce losses. But in the case of utilities nothing of the sort can be done.

What the Municipal Government is able to do and is doing to the best of its ability is to slow down the increases of the prices of coal, oil, parts and other essentials and to help the companies to obtain low interest loans so that the utility tariffs may avoid big jumps. Another thing the Municipal Government is doing is to instruct the companies to save all unnecessary expenses and reduce their operating costs as much as possible.

1. Comparison of price indices and utility tariff indices (August, 1948)

2. A Comparison of power rates in leading Chinese cities (July, 1948)

City	Name of Power Co.	Lighting rate (CN\$ per kwh)	Power rate (CN\$ per kwh)
Shanghai	Shanghai Power Co.	59,000	82,130
Nanking		115,000	105,000
Kiangsu		140,000	136,000
Chekiang, H'chow Power Co.		135,000	123,000
Hankow		100,000	124,000
Tientsin, French Power Co.		121,000	85,000

From the above, it can be concluded that the utility tariffs of Shanghai are not only lower than the prices of commodities but also lower than the tariffs of similar service in other cities in China. The fundamental reason why every increase of tariffs was objected to by the public is that although the utility tariffs are far lower than the commodity prices the purchasing power of the majority of the local populace has decreased even more. In other words the people are much poorer than before and they are unable to bear the burden of even the comparatively low utility rates.

In Nanchang, Kiangsi, power rate in August was CN\$500,000 per kwh and water rate CN\$900,000 per cubic meter. The August power rate in Hai-yien, Chekiang, was CN\$900,000. These rates were all much higher than the rates in Shanghai but there did not seem to be any objections from the public. The reason is that prices of commodities in Nanchang have been based on silver dollars while those in Haiyien based on the price of rice. Both of these places are not using the national currency as standard. Shanghai, in strict observance of Government regulations, gauge the prices of all commodities according to the national currency. Besides, the majority of its population are salaried employees paid in the national currency.

The whole thing touches the national economy and a complete solution lies in the hands of the Central Government. The population in Shanghai suffers the evils of inflation most. They naturally have more fervent hopes that the Central Government will quickly enforce a currency reform which will halt the inflationary trend.

If there is no currency reform, the only alternative will be to make the income of the people increase in the same ratio as the increase of commodity prices. Under the present circumstances, however, even those paid according to the COL Index are feeling that their incomes are not adequate to meet their expenditures. The index is published monthly at the end of each month. But prices, such as those of food, register increases almost daily. The income fixed monthly is of course not sufficient to meet the prices increasing daily. Furthermore the July COL Index in Shanghai for Government employees was 1,600,000, for salaried employees 1,500,000, and for workers 1,860,000. Everybody knew that the increases in the prices of commodities were much more than these.

We have pointed out in previous paragraphs the basic trouble of the problem. We have further pointed out that the only solution seems to lie in a currency reform. Now we want to go one step further. We want to point out that the currency reform as a solution is only expedient but by no means fundamental. Currency is merely the medium for exchange of commodities and is in itself of no value. What we really need is more goods, more food supply and more clothing for the people. They can only come from more production. Does the present circumstances allow more production? This is a basic question which I shall ask every body's co-operation to find a way out.

(Ta Kung Pao, August 23, 1948)

12. UTILITY RATES FOR NOVEMBER

New utility rates for November, representing increases of 300 to 400 percent over the frozen August rates, were formally announced yesterday by Commissioner of Public Utilities, Dr. T. C. Tsao.

The new tariffs for water, electricity, gas and telephone will be retroactive to November 1, 1948, while the rates for tram, trolley, bus and ferry will take effect from November 10, Commissioner Tsao asserted.

The new rates, which were approved by the Central Government, are tabulated as follows:

	Water	Each Unit
Shanghai Waterworks		GY0.50
French Waterworks		0.50
Chapei		0.65
Inland		0.65
Pootung		0.65
Electricity		
Shanghai Power Company		
&		
Western District Electric Company		
		Per kw.-hr.
Below 10 kwh.		GY0.18
Between 11 and 30 kwh.		0.24
Above 30 kwh.		0.47
Power		0.39
French Electric Company		
Below 10 kwh.		GY0.22
Between 11 and 30 kwh.		0.29
Above 30 kwh.		0.58
Power		0.49
Chapei Electric Company		
Below 10 kwh.		GY0.24
Between 11 and 30 kwh.		0.32
Above 30 kwh.		0.60
Power		0.50
Pootung Electric Company		
Below 10 kwh.		GY0.25
Between 11 and 30 kwh.		0.34
Above 30 kwh.		0.67
Power		0.56

Chinese Electric Company

Below 10 kwh.	GY0.27
Between 11 and 30 kwh.	0.37
Above 30 kwh.	0.76
Power	0.63

Dah Yao Electric Company

Below 10 kwh.	GY0.31
Between 11 and 30 kwh.	0.42
Above 30 kwh.	0.78
Power	0.65

Gas

Below 10 units	GY0.86
Between 11 and limit	1.50

Telephone

One to 150 calls	GY0.15
From 151 to 300 calls	0.20
Above 301 calls	0.30
Public telephone	0.10

Tram

First Class	GY0.15 to GY0.40
Third Class	GY0.10 to GY0.25

Midget Train

Each kilometer	GY0.06
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Bus

Each trip	GY0.15 to GY0.50
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Ferry

Cross Trans-Whangpoo	GY0.15 each trip
Long-distance per passenger knot	0.11

In announcing the new tariffs, Dr. T. C. Tsao, Commissioner of Public Utilities, mentioned the difficulties in fixing the new rates for this month due to so many uncertain factors which can not be foreseen.

"However, with the cooperation of the managements of the utility companies," continued Dr. Tsao, "we have come to an agreement to the new tariffs which we hope will at least cover the necessary expenses for the maintenance of the utility service."

Companies Cooperating

"So far," said the Commissioner, "the utility companies have endeavored their best in cooperating with the PUB to provide the public with utility services of fairly high efficiency."

Commissioner Tsao also commented on the grave fuel shortage which, he stated, may cause partial reduction of the services

if the Government can not procure adequate amounts of fuel and essential operational materials. Tsao said that the City Government had left no stone unturned to secure the fuel needed by the utility companies.

He further revealed that he will ask ECA-CUSA to render assistance in securing the fuel needed by the utilities, which he considered of primary importance to the public, next only to rice.

Commissioner Tsao added that he hoped that the public would cooperate by economizing the use of water, power, and gas, etc. as the present fuel situation is very grave.

(The China Press, November 8, 1948)

13. REVISED UTILITY TARIFFS ANNOUNCED BY PUB

Revised tariffs for utility services, which are to be effective from today for water, power, gas and telephone and from tomorrow for buses, trams, trolleybuses and ferries, were announced by Dr. T. C. Tsao, Commissioner of Public Utilities, yesterday.

The new tariffs marks an average increase of 2.5 times over the previous rates, and are necessitated by the considerable increases registered in foreign exchange rates, coal price, gasoline price and the COL Index, stated Dr. Tsao.

Commissioner Tsao further stated that is is the policy of the City Government to adjust tariffs according to the costs of the services to enable the companies to maintain their services and to eliminate any undesirable wastage on the part of the customers due to the low rates of the services, as compared with other commodity prices.

The PUB Chief said that the previous rates as announced at the beginning of this month were based on conservative assumptions which were made so that that the revision of the tariffs might not ge delayed. He went on to say that since the newly announced foreign exchange rates increased by five times, coal price four times, gasoline price six times, and the COL Index marked an increased five times more than estimated, it is practically impossible for the companies to cover their minimum expenses and make payments for fuel and wages. The new revised tariffs were decided at a meetinig convened by the Bureau of Public Utilities with the representatives of the City Council and the various utility companies and were then brought to Nanking and ratified by the Central Government, Commissioner Tsao concluded.

The new rates are as follows:

Water	Per Cubic Meter
Shanghai Waterworks	GY1.85
French Waterworks	1.85
Chapei	2.40
Inland	2.40
Pootung	2.40

Electricity Shanghai Power Company &

Western District Electric Company

Below 10 kwh.	GY0.65
Between 11 and 30 kwh.	0.85
Above 30 kwh.	1.70
Power	1.42

French Electric Company

Below 10 kwh.	0.70
Between 11 and 30 kwh.	0.90
Above 30 kwh.	1.85
Power	1.56

Chapei Electric Company

Below 10 kwh.	1.00
Between 11 and 30 kwh.	1.35
Above 30 kwh.	2.60
Power	2.19

Pootung Electric Company

Below 10 kwh.	1.00
Between 11 and 30 kwh.	1.35
Above 30 kwh.	2.60
Power	2.19

Chinese Electric Company

Below 10 kwh.	2.10
Between 11 and 30 kwh.	2.50
Above 30 kwh.	3.00
Power	2.51

Dah Yao Electric Company

Below 10 kwh.	1.30
Between 11 and 30 kwh.	1.75
Above 30 kwh.	3.38
Power	2.85

Average increase 289%.

Gas**Shanghai Gas Company
&
Woosung Gas Company**

	Per 100 Cubic Feet
Below 10 units	GY3.20
Between 11 and limit	5.85

Average increase 282%.

Telephone

	Each-call
One to 150 calls	GY0.45
From 151 to 300 calls	0.60
Above 301 calls	0.80

Public Telephone 0.30

Average increase 186%.

Tram

First Class	GY0.50 to GY1.30
Third Class	GY0.30 to GY0.90

Average increase 233%.

Midget Train

Each kilometer GY0.20
Average increase 233%

Bus

Each trip GY0.50 to GY1.80

Ferry

Trans-Whangpoo GY0.50 each trip
Long distance GY0.45 per knautical mile
Average increase 271%

(North China Daily News, November 20, 1948)

14. STATISTICS AND CHART

A. TABLE SHOWING COMPARISON OF UTILITY
TARIFFS AND COMMODITY PRICES

ITEM	AUGUST 1		AUGUST 19		NOVEMBER 1		NOVEMBER 20	
	Price	Index	Price	Index	Price	Index	Price	Index
Commodity Prices	Coal	GY. 26.74 per ton	1			GY.200.00	7.50	GY.592.00 22.2
	Gasoline	GY. 0.65 per gallon	1	GY. 1.12	1.723	GY. 2.90	4.46	GY. 16.60 25.27
	Heavy Diesel	GY. 75.00 per ton	1	GY.129.76	1.725	GY.467.00	6.20	GY. 1629.00 21.62
	U.S. Exchange	GY. 1.666	1	GY. 4.00	2.40	GY. 4.00	2.40	GY. 20.00 12.00
	COL Index		1		1.952		(1,9528.10)	15.82
Utility Tariffs	Power		1			3.95—4.06		12.6—17.35
	Water		1			3.9		14.4
	Gas		1			4.3		16
	Telephone		1			3.0 (average)		8.1
	Land Transport		1			3.1 (average)		10—11.55
	Water Transport		1			4.0 (averag)		14.2 (average)

B. TABLE SHOWING THE AVERAGE UTILITY TARIFFS

Base : 1936=1

TIME	Water		Electricity		Gas		Telephone		Tram		Bus		Small-gauge Railway		Ferry	
	Average tariff \$/cub. m.	Index	Average tariff \$/Kwh	Index	Tariff \$/100 cub. ft	Index	Average tariff \$/call	Index	Average fare \$/trip	Index	Average fare \$/trip	Index	Fare \$/passenger-km	Index	Fare \$/passenger Km and mile	Index
1936 (prewar)	0.1008	1	0.173	1	0.285	1	0.065	1	0.062	1	0.087	1	0.03	1	0.025	1
Sept. 1945 (take-over)	5.75	57	4.35	25	21	74	0.66	10	3.25	52	—	—	1.8	60	2	80
Nov. 1945	30	298	35	202	100	351	5	46	10	161	35	402	7.2	240	9.69	383
Jan. 1946	52.3	519	47	272	190	667	15	231	40	645	70	805	21.6	720	26.18	1,047
April. "	124.5	1,235	73	422	400	1,404	30	769	125	2,016	200	2,299	60	2,000	73	2,920
Nov. "	216.8	2,151	129	746	600	2,105	—	—	275	4,435	450	5,162	120	4,000	100	4,000
Feb. 1947	—	—	332	1,919	—	—	—	—	—	—	—	—	—	—	160	6,400
June "	433.6	4,302	593	3,457	1,200	4,210	100	1,538	575	9,274	1,000	11,494	240	8,000	320	12,800
July "	1,295	12,850	1,146	6,624	3,600	12,632	300	4,615	1,375	22,177	2,250	25,862	600	20,000	500	20,000
Oct. "	2,590	25,694	3,912	16,832	7,200	25,363	800	12,308	2,750	44,355	4,500	51,724	1,200	40,000	1,000	40,000
Nov. "	5,443	53,998	5,003	28,919	13,725	48,158	1,400	21,538	—	—	—	—	—	—	—	—
Jan. 1948	8,127	80,625	7,334	42,509	22,500	78,877	2,400	36,923	4,750	76,613	7,000	80,460	1,600	53,333	1,660	66,400
Feb. "	10,607	105,228	8,986	51,942	18,200	98,947	3,400	52,308	6,250	100,806	9,000	103,448	2,000	66,667	2,300	92,000
March "	13,944	138,333	12,845	74,249	39,500	138,596	4,500	69,231	8,500	137,098	13,000	149,425	3,000	100,000	4,000	160,000
April "	23,575	233,829	21,815	126,098	66,000	231,579	9,000	138,462	14,000	225,806	20,000	229,885	4,200	140,000	6,000	240,000
May "	28,146	279,226	26,015	150,376	78,000	273,684	10,500	161,538	16,500	226,129	22,500	258,621	5,000	166,667	6,500	260,000
June "	37,998	276,964	35,112	202,960	105,000	368,421	14,000	215,358	22,500	362,903	30,000	344,828	6,500	216,667	8,000	320,000
July "	104,750	1,039,187	84,562	488,798	285,000	1,000,000	40,000	615,385	57,500	927,419	75,000	862,068	15,000	500,000	22,000	880,000
Aug. "	328,710	3,261,012	157,112	908,162	701,250	2,460,526	85,000	1,307,692	145,000	2,338,710	190,000	2,183,908	40,000	1,333,333	68,000	2,720,000

NOTE: (1) There are five waterworks companies in Shanghai with different tariffs. The average tariff is obtained by adding the tariffs of the companies multiplied by the percentages of their respective sales over the total sale. The percentages in 1947 were as follows: (1) SWW 55.6 (2) French 21.9 (3) Chapei 10.7 (4) Inland 11.2 (5) Pootung 0.6

(2) The average tariff of electric power is obtained in the same manner as that of water. (1) SPC & WDPC 70.1 (2) French 17.3 (3) Chapei 6.4 (4) Nantao 5.0 (5) Pootung 6.2

(3) The average fares of tram & bus are the averages of the minimum and maximum fares of tram & bus respectively.

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C. TABLE SHOWING THE INDICES OF THE INCREASES OF UTILITY TARIFFS
September, 1945—August, 1948
Base: 1936=1

TIME	Water, Electricity & Gas				Water and Land Transportation					Telephone
	Average	Water	Electricity	Gas	Average	Tram	Bus	Small gauge railway	Ferry	
Sept. 1945	53	57	25	74	64	52	—	60	80	10
Nov. "	284	298	202	351	298	161	402	240	388	46
Jan. 1946	486	519	272	667	804	645	805	720	1,047	231
April "	1,020	1,235	422	1,404	2,309	2,016	2,299	2,000	2,920	769
Nov. "	1,667	2,151	746	2,105	4,399	4,435	5,162	4,000	4,000	769
Feb. 1947	2,058	2,151	1,919	2,105	4,999	4,435	5,162	4,000	6,400	769
June "	3,990	4,302	3,457	4,210	10,392	9,274	11,494	8,000	12,800	1,538
July "	10,702	12,850	6,624	12,632	22,010	22,177	25,862	20,000	20,000	4,615
Oct. "	22,596	25,694	16,832	25,263	44,020	44,355	51,724	40,000	40,000	12,398
Nov. "	43,692	53,998	28,719	48,158	44,020	44,355	51,724	40,000	40,000	21,538
Jan. 1948	67,337	80,625	42,509	78,877	69,202	76,613	80,460	53,333	66,400	36,923
Feb. "	85,372	105,228	51,942	98,947	90,730	100,806	103,448	66,666	92,000	52,308
March "	117,059	138,333	74,249	138,596	136,631	137,098	149,425	100,000	160,000	69,231
April "	197,168	233,829	126,098	231,579	208,923	225,806	229,885	140,000	240,000	138,462
May "	234,429	279,226	150,376	273,684	237,854	266,129	258,621	166,667	260,000	161,538
June "	316,115	376,964	202,960	368,421	311,099	362,903	344,828	216,667	320,000	215,358
July "	842,662	1,039,187	488,778	1,000,000	792,372	927,419	862,068	500,000	880,000	615,385
Aug. "	2,209,900	3,261,012	908,162	2,460,526	2,143,988	2,338,710	2,183,908	1,333,333	2,720,000	1,307,692

N.B. Statistics for telephone based on the minimum rate.

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D. TABLE SHOWING THE INDICES OF THE INCREASES OF THE MAJOR ELEMENTS OF UTILITY TARIFFS

September, 1945—August, 1948

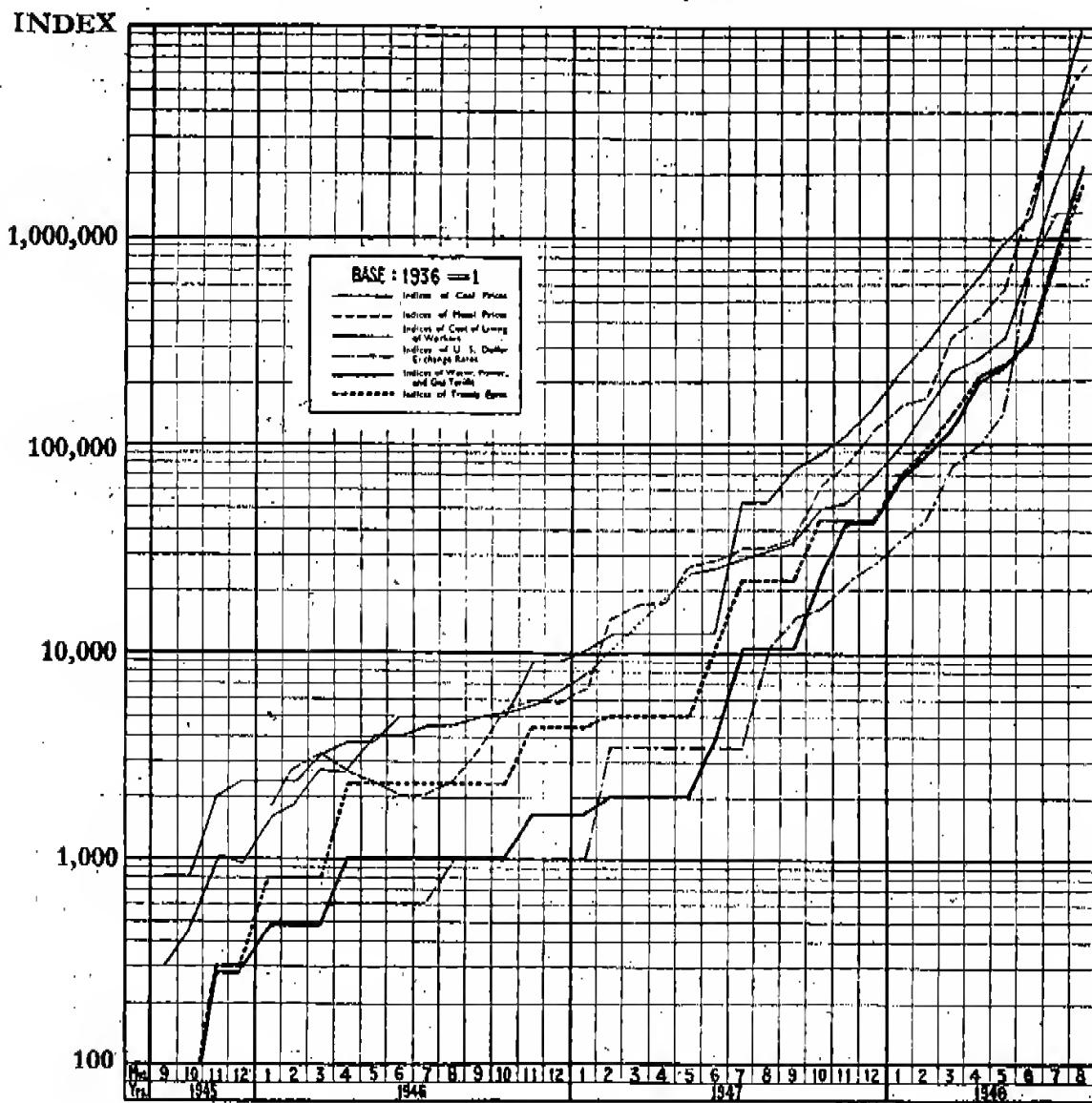
TIME	Workers COL Index	Metal Price Index	U. S. \$ Exchange		Coal	
			Rate CN\$/US\$	Index	Price CN\$/ton	Index
1936 (prewar)	1	1	3.33	1	10	1
Sept. 1945	299				8,000	800
Oct. "	441				8,000	"
Nov. "	1,022				20,000	2,000
Dec. "	945				24,000	2,400
Jan. 1946	1,062	1,813			"	"
Feb. "	1,846	2,808			"	"
March "	2,754	3,284	2,020	607	32,000	3,200
April "	2,694	2,779	"	"	38,000	3,800
May "	4,096	2,404	"	"	"	"
June "	4,041	2,048	"	"	50,000	5,000
July "	4,494	2,128	"	"	"	"
Aug. "	4,537	2,413	3,350	1,006	"	"
Sept. "	4,967	3,424	"	"	"	"
Oct. "	5,219	5,475	"	"	"	"
Nov. "	5,685	5,990	"	"	90,000	9,000
Dec. "	6,470	5,816	"	"	"	"
Jan. 1947	7,946	6,817	"	"	105,000	10,500
Feb. "	—	14,623	12,000	3,604	125,000	12,500
March "	—	17,005	"	"	"	"
April "	—	17,490	"	"	"	"
May "	23,500	26,654	"	"	"	"
June "	25,300	28,223	"	"	"	"
July "	28,700	31,831	"	"	540,000	54,000
Aug. "	31,000	32,848	38,500	11,562	"	"
Sept. "	34,000	36,104	49,500	14,865	740,000	74,000
Oct. "	49,100	62,935	55,300	16,607	880,000	88,000
Nov. "	53,100	77,827	73,000	21,922	1,160,000	116,000
Dec. "	68,200	112,770	89,000	26,727	1,508,000	150,800
Jan. 1948 "	95,200	154,870	119,500	35,886	2,180,000	218,000
Feb. "	151,000	169,710	149,000	44,745	3,000,000	300,000
March "	217,000	340,220	255,000	76,577	4,490,000	449,000
April "	262,000	433,800	324,000	97,297	6,540,000	654,000
May "	337,000	584,720	474,000	142,342	9,464,000	946,400
June "	710,000	1,306,000	2,400,000	720,000	12,255,000	1,225,500
July "	1,380,000 1,860,000	3,630,700	4,400,000	1,321,321	35,054,000	3,505,400
Aug. "	3,630,000	6,279,400	"	"	96,000,000	9,600,000

**E. TABLE SHOWING THE INDICES OF THE RETAIL
PRICES OF COMMODITIES**

Base : January—June, 1937 = 1

TIME	Total Index	INDEX			
		Food	Clothing	Fuel	Miscellaneous
Jan. 1946	1,718	1,337	2,588	3,497	1,363
Feb. ,,	2,814	2,370	3,692	5,473	2,153
March ,,	4,007	3,620	4,430	9,788	2,621
April ,,	3,964	3,744	4,038	8,608	2,713
May ,,	4,525	4,882	4,369	7,415	2,742
June ,,	4,925	5,323	5,192	7,550	2,815
July ,,	5,288	5,523	5,404	8,776	3,264
Aug. ,,	5,557	5,742	5,750	9,624	3,388
Sept. ,,	6,665	6,628	7,205	10,634	4,545
Oct. ,,	7,841	7,343	10,099	11,879	5,386
Nov. ,,	7,798	7,242	9,345	13,970	5,310
Dec. ,,	8,655	7,677	11,359	15,675	6,010
Jan. 1947	10,485	9,251	13,012	19,896	7,619
Feb. ,,	15,334	13,431	17,604	29,280	12,349
March ,,	15,804	14,267	16,970	31,085	12,359
April ,,	18,308	16,573	20,248	30,141	15,485
May ,,	26,760	25,773	29,087	39,104	21,030
June ,,	30,772	30,197	35,015	41,508	23,012
July ,,	37,398	33,714	46,416	51,034	31,983
Aug. ,,	40,046	37,050	47,610	57,021	32,403
Sept. ,,	51,607	45,853	59,147	92,974	41,605
Oct. ,,	78,365	68,424	94,600	153,500	59,190
Nov. ,,	86,702	74,477	110,760	168,780	64,620
Dec. ,,	107,450	94,193	129,530	192,090	85,455
Jan. 1948	153,220	147,970	154,250	249,970	120,880
Feb. ,,	212,230	211,450	207,150	305,920	172,620
March ,,	342,010	321,410	385,770	436,390	302,220
April ,,	404,990	384,980	489,010	496,080	330,220
May ,,	562,950	560,890	651,040	607,280	460,010
June ,,	1,103,800	973,260	1,408,600	1,468,000	987,710
July ,,	3,318,000	2,762,500	4,458,300	5,371,600	2,883,200
Aug. ,,	6,249,100	5,473,300	8,353,500	9,050,000	5,110,600

F. CHART SHOWING THE INDICES OF THE INCREASES OF
UTILITY TARIFFS & MAJOR ELEMENTS



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PART IX MISCELLANEOUS

1. LOCAL TRAINING FOR UTILITIES ENGINEERS

The two basic requirements of any large scale enterprise are capital and personnel.

Of the two, efficient and competent personnel, on which the successful operation of the enterprise depends, are the more difficult to procure. It takes time to train good and efficient personnel.

A public utility is an industrial enterprise involving the application of the science of engineering. Its successful operation depends on able and competent "personnel."

Under the able leadership of Dr. T. C. Tsao, Commissioner of Public Utilities, there has been established for the public utilities of Shanghai, unified schemes of developments.

Far-reaching will be the effects of his efforts along the promotion of the United Power Company, and the planning of the United Waterworks Company, the United Transit Company, the United Gas Company, and the United Telephone Company, which are intended to unify, with no interference with the franchises of the existing companies, the supply systems of the utility services, thus assuring a higher standard of service with the maximum economy.

Training Classes in Shanghai

School education lays the foundation of a man's development of his resourcefulness. Nevertheless, it is the training which he receives after school days that builds up his capability and experience.

For the same purpose, an engineering graduate will have to undergo years of training and practice to apply the technical knowledge acquired in school days.

Dr. Tsao, knowing only too well that the realization of his plans will need many technicians, is planning to utilize some of the best existing utility companies for the training of his future personnel.

The American-owned Shanghai Power Company and Shanghai Telephone Company are among the biggest utility industries in the Far East. With the hearty cooperation of the managements of these two companies, an agreement to sponsor training classes was reached and carried out in 1946. In 1947, the French Company reinforced the training program by agreeing to the opening of another class.

Dr. Tsao had another object in mind when he launched the training classes. The Shanghai Power Company and the Shanghai Telephone Company are both American-owned and their systems of operation, management and supervision, and engineering standards will serve as excellent models of the utility industries which may hereafter be developed in other major cities of China.

Dr. Tsao had the whole country of China in mind when he foresaw the future demand of utility engineers and launched the training programs. His engineers will not only serve the utility services of Shanghai but may well prove to be the key personnel of the future utility industries of China.

The Programs

A word about the training programs. The programs and regulations were jointly drafted by the companies and the Bureau of Public Utilities. Trainees have been recruited from the engineering graduates of leading Chinese universities.

The programs are as follows:

A. Power Company:—

1.—Generation Department (including repair shop, drafting room, mechanical equipment maintenance, testing and statistics, chemical laboratory, boiler operation, turbine operation, operation control room).

2.—Distribution Department (including overhead line construction and maintenance, street lighting, second class substation maintenance, first class substation operation and maintenance, underground cable construction and maintenance, substation construction, relays, system management, emergency repairs and statistics).

3.—Instruments and Meters Testing Department (including standard testing room, repair shop, meter testing, instruments repairing and testing).

4.—Engineering Department (including engineering estimates, circuit designing, engineering budgeting, practical accounting, record and statistics).

B. Telephone Company:—

1.—Outside plant construction and maintenance.

2.—Subscribers' apparatus installation and maintenance.

3.—Manual and automatic central office installation and maintenance.

4.—Supplies and general plant routine.

5.—Workshop practice (With China Electric Co.).

6.—Outside plant engineering.

- 7.—Central Office engineering.
- 8.—Traffic operating engineering, routines and practices.
- 9.—Commercial routines and practices.
- 10.—Comptroller routines and practices.

The period of training for power engineers is four years and that for telephone engineers two and a half years. Salaries for the trainees are \$80 basic at the start and will be increased every year to \$150 for the power engineers and \$125 for the telephone engineers, all basic salaries to be multiplied by the COL Index.

Certificates Issued

A Supervisory Committee consisting of experts from the Bureau of Public Utilities and the companies is organized to check the records of the trainees. Certificates will be issued to the trainees after completion of training. They may then be employed either by the two companies or by other companies at the recommendation of the PUB.

Since 1946, when the program was started, there have been recruited 16 electrical engineers and 16 mechanical engineers for the Shanghai Power Company and 22 engineers for the Shanghai Telephone Company, a total of 54.

When classified according to their alma maters, there were 32 graduates from the Chiaotung University, 6 from the Central University, 5 from the Chekiang University, 2 from the Tsinghua University, 3 from the Utopia University, 5 from the University of Shanghai, and 1 from the Amoy University.

Examination on August 16

The open examinations of the two companies for this year will be held on August 16, 1948. Advertisements have appeared in newspapers in Wuhan, Chungking, and Canton, with enrollment offices there to give chances to engineering graduates in other cities to apply.

(North China Daily News, August 2, 1948)

2. REPORT MADE BEFORE THE SMG ADVISORY COMMITTEE ON GASOLINE ALLOCATION

October 13, 1948.

Mr. Chairman, Gentlemen:

At the end of September, we received a mandate from the Central Government instructing us to carry out the austerity measures in the use of motor vehicles and gasoline. The mandate clearly stated that Shanghai was to have a one-third cut of the number of vehicles and gasoline quota.

The Municipal Government, after a series of meetings, decided on an alternate scheme which would have the same effect of austerity as the mandate from the Central Government but which would be more practical and feasible. That scheme has been presently adopted for enforcement in Shanghai and reported to the Central Government for endorsement.

There is no need for me to say that our present scheme is a temporary one, one that is subject to and welcomes constructive suggestions of improvement.

Now the scheme.

According to the scheme, there are roughly five groups which are entitled to different rations of gasoline.

The first group, including public buses, vehicles for public services, and business trucks and taxis, is exempt from reduction.

The second group, vehicles owned by governmental organizations and "authorized" private corporations, viz. banks, newspapers and new agencies, mines, and large factories producing daily necessities, will have three vehicles entitled to the "full" ration and one vehicle entitled to the "basic" ration, out of every four.

The third group, vehicles owned by "unauthorized" private corporations, has one vehicle out of every two entitled to the "full" ration and one vehicle entitled to the "basic" ration.

The fourth group, the "authorized" private persons, viz. medical doctors, has one vehicle only entitled to the "full" ration, and the remaining vehicles, if any, to the "basic" ration.

The fifth group, the "unauthorized" private persons' vehicles, has its vehicles entitled to the "basic" ration only.

Full ration means the quantity of gasoline as announced per Proclamation No. U49 of the Municipal Government. Basic ration means 10 gallons per month for each passenger car and 20 gallons for each truck.

I would like to add here that our present Scheme, referring specifically to the five broad groups as stated above, follows the pattern as provided for by the orders of the Central Government.

Nevertheless, in view of the fact that there are many what we term "unauthorized" private persons who register vehicles in their own names but use them for carrying out their official or business duties, the Municipal Government announced per Proclamation No. U53 that application for gasoline ration adjustment may be made to the Scrutinizing Committee on or before October 15. A few days following the announcement I called a press conference to clarify the policy of the Municipal Government for gasoline ration as stated above.

While the official gas quota for Shanghai in the month of October is not yet known, it is believed that the allotment will not be more than 1,150,000 gallons. The grant of upward adjustment of gasoline ration will naturally depend upon the oil quota. It will be meaningless to give ration exceeding the quota.

As the system is still in the process of evolution, we like to have your constructive suggestions to improve it and to solve the difficulties.

Gasoline Allocation in October, 1948

Vehicles	Quantity of Gasoline Earmarked (A.G.)	Quantity of Gasoline Allocation (A.G.)
Public buses	256,360	256,360
Business trucks	194,334	194,334
Taxis	48,160	48,160
Private trucks	117,510	117,336
Private passenger cars	140,200	125,002
Motorcycles	19,986	19,986
Vehicles with trade licenses	903	903
Extra rations	51,829	51,829
TOTAL	829,282	813,910

3. THE ENGINEER AND THE PUBLIC WELFARE

T. C. Tsao

June 6, 1948, Engineers' Day

Radio address to all China's Engineers

It goes without saying that "clothing, food, housing, and transportation" constitute the four necessities of living and that, whereas the standard varies in different countries and in different parts and social strata of a country, the maintenance and elevation of such a standard over and above a certain minimum is absolutely essential to the welfare, peace and order of a nation.

Now let us pause to think. What role does the engineer play in the struggle for providing the means of living and the struggle for better and improved living? I have not the least hesitation to say that engineering, as an applied science, points the way to abundance and prosperity, and the engineers, as pioneers, builders and operators, are responsible, more than any other group of fellow-men, for better living, peace maintenance and civilization advancement of the world.

As time goes on, there will be greater realization of the ever growing greatness, importance and contribution of the engineering profession. The hydraulic engineer in building flood-control and irrigation works, the chemical engineer in providing the fertilizer and insecticides, and the mechanical engineer with improved farming machinery and implements are to a large extent jointly responsible for greater food production. The textile, chemical and mechanical engineers are responsible for the clothing fabric; the architectural engineer builds the houses for human occupation and production activities. Transportation, distribution and exchange of products by rail, road, water and air are made possible through the efforts of the engineer.

Engineers are devoting their brain and brawn to the benefit of mankind. The engineer must necessarily be versed with fundamentals of science, economics, law and business, besides his special technology, in order to carry out his work successfully. In the alignment of a railway or the selection of a dam site, the engineer has to weigh many factors, economical, political and technical. The engineer recognizes that above all the public welfare is the sole objective of his services.

One of the greatest engineering and beneficial achievements of this age, probably, is the TVA in the United States. The

beauty and uniqueness of the TVA lies not so much in the gigantic scope of construction undertakings as the manifestation of what unlimited public welfare the coordinated efforts of all relevant engineers can do. In this project, civil engineers, electrical engineers, mechanical engineers, hydraulic engineers, sanitary engineers, chemical engineers, all work in a united team with a common selfless aim.

The Tennessee River had always been not only idle but often destructive. The Tennessee Valley suffered many floods and the River was almost useless for navigation. After many years' efforts of the Tennessee Valley Authority, however, the River has been harnessed to work for the people. The River has been brought under control, its boundless energy now works for the people in the form of electric power. The River has been developed into a series of lakes of navigational value and with scenic beauty. Large quantities of fertilizer have been manufactured to revive the fertility of the land. The whole Valley has been developed by the Authority under overall plans mapped out to realize the total potential value of the River and to give the greatest benefits to the Valley.

I have always held the firm conviction that the two major requirements of developing a country are "production" and "transportation."

Many of China's rivers offer potential sources of water power and yet the amount developed as compared with the available potentiality is very small. An unmistakable yardstick of a country's wealth, strength, and material, if not spiritual, civilization is the amount of power produced per capita. The annual power production per person in China was 5.1 kwh whereas in U.S.A. it was 1,530 kwh. Cheap and abundant power supply always leads to increased production and, therefore, abundance in the of a nation.

Transportation is another most important factor in the national economy. With adequate systems of transportation, towns, villages and provinces of the country, instead of being separate economic units, will be united and bonded together to receive mutual benefits that may be acquired by the production of commodities best suited to their own localities.

Engineers in China have an important mission to perform. They need broad vision, knowledge and experience. Their duty to the nation demands ability in harnessing, coordinating and organizing various forces to overcome the difficulties and obstacles of progress. As highly educated men, they must prepare themselves to lead the society wherever they may be. They must be able to convince and guide their fellow countrymen that

reconstruction and production are the only means of bringing satisfaction and welfare to the country's majority.

Today is the Engineers' Day, a day for us to review our past and plan our future. China is a relatively undeveloped country and offers us excellent chances for work that can not be had elsewhere. Our responsibilities are enormous, but our chances are unlimited. Let us refresh our mind that it is our duty to make China a happy and prosperous place to live in.

(Broadcast through Station XLAH3 (940 kc), Shanghai)

4. COMMUNICATIONS EXHIBITION AT LOCAL UNIVERSITY

The first Telecommunication Exhibition, jointly sponsored by the Chinese Society of Electrical Engineers and the China Amateur Radio League, was inaugurated yesterday morning at Chiaotung University.

Dr. T.C. Tsao, Commissioner of Utilities of Shanghai, delivered the inauguration speech.

Among the many notables attending were Mr. Walter F. Flanley of the Shanghai Telephone Company, Director Benjamin Yoh of the Shanghai Telecommunication Administration, Mr. C. H. Chuang of Chiaotung University, C. S. Kao of the PUB, and many others.

Dr. Tsao, in his address, dealt with three important phases in telecommunications. The first is the study and research of the science of telecommunications, as represented by Chiaotung University he said. The second is the operating and servicing phase of the science as represented by CGRS, STA, and STC. The third and last phase is that of manufacturing the materials and equipments for telecommunications, as represented by the many manufacturers here.

The three phases are of equal importance, he said, for the lack of any one will greatly handicap and even cause a disruption of the telecommunication service.

Popularity of Radio

Two of the proudest products of the 20th century are "Aviation" and "Radio," Dr. Tsao went on. Of the two, radio deserves special attention because of the huge popularity enjoyed by it.

"Its convenient and portable size and cheapness make possible the possession of a radio by an average family," he said. "Broadcasting stations are having daily and uninterrupted contacts with the public. Not only is it indispensable to political organizations and military setups for communication and signal service, but it has gradually become a necessity to the average home as a interesting form of amusement and recreation. Educators, missionaries, politicians, business men all employ radio as the chief means of giving publicity and propaganda to their respective interests. To sum up, it is an indispensable weapon for communication service, and it is also a "must" for adding comfort and beauty to the lives of human beings."

Tribute to Amateurs

While due tribute should be paid to many scientists who had devoted their lives to the invention of radio or electro-magnetic waves, Dr. Tsao pointed out that the world should not overlook the fact that the rapid advance of the science of radio has been a direct result of the efforts of innumerable radio amateurs. The greatest assets of the amateurs lie in their untiring spirit of "experiment," "co-operation," and "service."

"Because of the endless series of experiments, there have been new discoveries, new technique which are responsible for making rapid progress in the science of radio," he declared. "Because of the spirit of co-operation, any knowledge and discovery of the radio amateurs have been shared by all, the exchange and accumulation of which further stimulate the progress of the science. Because of the spirit of public service, radio amateurs had contributed greatly in the 1st and 2nd World Wars. Especially commendable are the tens of thousands of radio amateurs who joined the all-important signal service of the Armed Forces of the United Nations.

"That this Exhibition is being held in the Chiaotung University, the cradle of electrical engineering of China, is most appropriate," he went on. "At the present time when ideologies are prevailing in various countries, we have to promote the development of radio engineering and to encourage and arouse the interests of our people to study the science of radio in order to make our country a safe and happy place to live in," Dr. Tsao concluded.

(North China Daily News, May 3, 1948)

PART X APPENDIX

1. A MODEL ENGINEER—(Central News Daily)

(June 6, 1947, The Engineers' Day)

One of the unfailing yardsticks of the strength of a nation is the number of engineers in the nation. In the pursuance of wisdom, the advancement of technology, by research, by experiment, by actual construction or administration, the engineers, always alert on new discoveries, profiting by past experiences, eager to dig into newer and newer fields, have one common unselfish goal, the welfare of the nation and its people.

On the eve of the Engineers' Day, the writer called on one of the model engineers of the country, Mr. T. C. Tsao, Commissioner of Public Utilities of Shanghai.

One of the prerequisites of a good engineer is a complete personality. Mr. Tsao is an excellent model engineer. He is capable, progressive, with a distinguished scholastic record, rare integrity, unusual energy, inspiring leadership and broad education, experience and vision. He has special affinity and talents in science. With a pipe in his mouth, through the smoke rings, he would allow his mind wander far to the realm of his exceedingly creative mind. With humble air, he would discuss and seek knowledge from people of all walks of life. He with no hesitation, said to the writer, "I am only 7 years old, because Professor Pitkins had said 'Life begins at forty.' I must work well with all my energy and to the best of my ability. I am really too young." He has an engineer's attitude toward life; that is, to understand the world and to live in it, to fully utilize the value of life, to rationalize it with a view of benefiting mankind, to go after "truth," "beauty," and "perfection," and in dealing with any matter to start from "truth" to achieve the goal of "perfection" through the passage of "beautification."

Mr. Tsao came from a family of letters. He went through the Middle School of Nanyang College, now Chiaotung University, Shanghai, and then pursued his college education at the same institute where he took the degree of bachelor of science in electrical engineering in 1924 and was elected a member of Phi Tau Phi Scholastic Honor Society. He was later sent by the Ministry of Communications to acquire practical experience as a college apprentice in the Metropolitan-Vickers Electrical Manufacturing Company in Manchester, England, where he worked for three years. In 1927 he underwent further training at the Siemens Company and Telefunken Radio Company in Germany. From there he crossed the Atlantic to

continue his studies in Harvard University in U.S.A., where, in 1929, he graduated with the degree of master of science in electrical engineering.

Upon his return to China on the same year, Mr. Tsao assumed the professorship of electrical engineering at the National Chekiang University in Hangchow, and was appointed the Dean of the School of Electrical Engineering in the following year.

In 1931, he accepted the offer of the directorship of Chekiang Provincial Telephone Administration, and concurrently a member of the National Reconstruction Commission. During the tenure of office Mr. Tsao successfully completed the long distance telephone network of Chekiang. In 1936 he was concurrently the Secretary General of the Provincial Reconstruction Bureau. In winter, 1937, when the Japanese were attacking Hangchow, he bravely directed telecommunication service of the war front and at the same time managed the withdrawal of provincial telephone equipments and technicians. A few hours after he left Hangchow, the Japanese troops broke the defences to occupy the city.

When the Chekiang Provincial Government moved to South-ern Chekiang, more duties were added to Mr. Tsao's shoulders. In addition to directing the Telephone Administration, he was assigned to establish the Eastern Chekiang Power Plant and the Industrial Betterment Service. In 1939 the Central Government offered him the post of Special Commissioner of Telecommunications of the Ministry of Communications in charge of the telecommunications in the five South-Eastern provinces. In 1943, Mr. Tsao became the Ministerial Director of Posts and Telecommunications of the National Government, in Chungking. It was under his directorship that the Telecommunications Directorate General was first established and the Telecommunications Code drafted which was now under the investigations of the Legislative Yuan. Mr. Tsao was also invited to be a member of the Central Planning Board and together with Mr. Chen Pai Chuang (now Director of Shanghai-Nanking and Shanghai-Hangchow Railways Administration) contributed much to the early comple-tion of the post-war communications rehabilitation plans.

With the advent of V.J. Day, the Central Government, in full appreciation of Mr. Tsao's ability, appointed him the Commissioner of Public Utilities of Shanghai. Although only two years have passed since the appointment, the people in Shanghai have already shown much appreciation of his capabilities and his efforts in rehabilitating and improving the utility service of Shanghai. Inspite of the present difficult situation and inspite of the extreme shortage of funds, foundations have been laid for the future expansion of the utility services.

Before the war, the administration of the utility services fell in the hands of three separate administrations. Since the rendi-tion of the settlement and the concession, the municipal adminis-tration is unified. The control of the utility services is also uni-fied and has been vested in the able hands of Mr. Tsao.

Designed to improve and expand the utility services of Shanghai, the six projects which are nearest to Mr. Tsao's heart and which have received his constant care and untiring efforts are as follows:

(1) One of the most pressing problems of present-day Shanghai is water supply for the Western District. PUB's esti-mate revealed that only about one third of Shanghai's population is served by the water companies. Mr. Tsao's efforts have im-proved the situation a great deal but more efforts have to be made before the problem can be completely solved.

(2) The City shall have a high-tension power transmission network in order to reduce line losses. If all the new generators of the power companies of Shanghai can be concentrated in one plant in the form of United Power Company as has been propos-ed then the biggest and most efficient generators can be used, leaving smaller generators which are less efficient as reserve gen-erators, and thus reducing the costs of operation. The United Power Company now under promotion is for that great purpose.

(3) Gas is a necessary utility for a cosmopolitan city. It is planned that another gas-works will be built in Nantao (south-ern part of the city) to increase the supply. In future gas standards will also be made uniform, with all the gas-work united by a high pressure gas network.

(4) Bus terminals should connect with terminals of tram lines. In modern city planning trolley buses are more adopted as the main means of transportation in the city.

(5) Telephone service is the nerve system of a city. Pre-sent-day Shanghai, however, has two organizations operating two different systems of telephone service. A unification scheme had been drafted by the Bureau and is now in the Executive Yuan for its approval.

(6) Before the Whangpoo River is spanned by a bridge or a tunnel, ferry is the most convenient and economical means of communication between the two banks of the River for passengers and cargoes. Even when the River is spanned by a bridge the existence of ferry as a subsidiary cross-river facility is still necessary.

Mr. Tsao then went on to comment on the land, water, and air transportation problem of the city. Mr. Tsao stressed upon the importance of the harbor facilities of Shanghai. The superior

geographical location of Shanghai contributed greatly to its growth to the present size and importance. Shanghai is near the center of the coastline of China and is the same time the entrance port of the great Yangtze River. Furthermore, the Whangpoo River serves as an excellent berthing place for both inland and sea vessels. Mr. Tsao is remarkably familiar with the statistics of the port affairs of Shanghai. According to him, the prewar quantity of net registered tonnage, entered and cleared in the Port of Shanghai was more than 35,000,000 tons, or over 30 percent of the tonnage of the whole nation. Two years after the war, the figure jumped to 85 percent. When re-construction starts, most of the equipments would be imported through Shanghai. Our future finished products will also be exported through Shanghai. Shanghai will indeed in future be the most important international trading and transshipping center in China and therefore must have a permanent and up-to-date port authority. Mr. Tsao said that the Port of Shanghai must provide with the most economical and quickest loading and unloading facilities, with deep channels, mechanized cranes, classified godowns and specialized wharves, and complete harbor facilities under unified management.

The Organic Law of the Port Authority of Shanghai had been drafted under the chairmanship of Mr. Tsao, who headed the Drafting Committee of the Shanghai Port Regulation Commission. The Organic Law is now handed to the Executive Yuan for its approval.

For land transportation Mr. Tsao advocated the separation of passenger and cargo services of railways. Locations of stations should fit in with the environments. The present center of passenger stations in Shanghai is North Station. The center shall preferably be moved to a new district in Chapei where a union station is to be constructed. For air transportation the Lunghwa Airfield is too small for an international air station. Air transportation center should be moved to Hungjao or further to the west and such center should conform with the standards of an international air station.

Mr. Tsao concluded the interview by telling the writer that to construct Shanghai two points must not be neglected. First, Shanghai is an international trading port, and second, Shanghai is the center of China's light industry. An international port needs modern harbor and transportation facilities. An industrial center needs an adequate electric power network. All the development of the public utilities of Shanghai shall be directed to proceed with the two objectives in mind.